



Building a better
working world

Southern Tier REDC

Phase II Regional Sector-Based Strategies

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November 2022

Executive summary

Recent investments demonstrate the State of New York's commitment to growing a strong and durable workforce for the future economy. Via the newly created Office of Strategic Workforce Development (OSWD), Empire State Development (ESD) and the Regional Economic Development Councils (REDCs) have identified the industry sectors that have the most potential for growing inclusive, robust economies in each region and throughout the state. Accomplishing this goal will require continued investments and coordination at the state level, renewed collaboration between stakeholders in each region, and comprehensive assessments of existing and potential capacities in the workforce development ecosystem. A specific focus of this effort is the necessary strategies and partnerships that can have the most impact on increasing labor force participation, especially among underserved populations across the state.

Over the course of the project, the EY team, in partnership with Stragility, LLC. (a NYS Certified WBE), worked closely with the Southern Tier REDC to establish sector priorities and develop strategic considerations that support and augment existing strategies and have the most promising impact on economic growth and opportunity for the local workforce and industry. During the research and stakeholder engagement process, our team discovered several common themes across the regions and state. These themes formed the basis for strategy development and are expanded on further in the report. They include:

- ▶ Strategies for driving long-term competitiveness and **sustainable talent pipelines in the targeted sectors require intensive collaboration at the state, regional and local levels.** Some effective coalitions exist, but enhanced efforts in information sharing and the development and alignment of regional strategies can prevent duplication of efforts when building effective workforce strategies.
- ▶ Significant work remains in **raising awareness of careers in the tradable sectors.** Articulating the **wage potential and funded training and supports is important in reaching the most vulnerable** populations and will serve to counter misperceptions about technical careers.
- ▶ Labor force participation has negatively impacted incumbent labor pools, and training initiatives alone are not the solution. **Special considerations are important to reach the underserved,** and to compel those not seeking employment today to return to the workforce.
- ▶ There is inconsistency in the **supply of educational programming, K-12 to industry pathways, and job placement consortiums** that create opportunity and contribute to successful talent acquisition and retention in the targeted sectors.
- ▶ **Employer engagement is essential** in the development of new training, identification of essential skills, and adoption of direct placement programs in the workforce development pipeline.

The Southern Tier is ripe with potential, as home to large, multinational companies, an emerging and innovative energy storage sector and top tier research universities and community colleges dedicated to community betterment. But it is not without challenges, especially as a largely, rural region where resources and opportunity vary immensely. This regional diversity elevates the important role Southern Tier REDC plays in bringing the region together to activate coordinated plans for supporting workforce and industry. Its convening power is also essential to aligning resources when possible and encouraging the sharing of information and leading practices. This opportunity is only heightened with the momentum surrounding the region's winning Build Back Better Regional Challenge application. Working together as a region, a stronger ecosystem and more vibrant, equitable economy is possible.


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Disclaimer

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A photograph showing two individuals, a man and a woman, focused on working on a small electronic device. The man, on the left, is wearing clear safety glasses and a dark blue shirt. The woman, on the right, is wearing red safety glasses and a dark blue shirt. They are both looking down at the device, which is a small circuit board with various components. The background is slightly blurred, suggesting a workshop or laboratory setting.

Introduction

Project overview

In the spring of 2022, New York Governor Kathy Hochul launched the Office of Strategic Workforce Development (OSWD) with a \$350 million investment to align regional workforce development efforts with the needs of employers in New York, particularly those in growing sectors. Under the direction of the Empire State Development (ESD), OSWD is charged with coordinating with agency partners, employers, institutions of higher education, and regional stakeholders to achieve the following goals:

- ▶ Expanding access to training and placement support for underserved communities that have traditionally faced barriers to employment
- ▶ Ensuring New York's workforce is equipped with skills to meet the needs of businesses in high-growth, tradeable sectors across the state
- ▶ Creating pathways for unemployed and underemployed New Yorkers to access good jobs that provide economic security and opportunities for career growth
- ▶ Sustaining talent pipelines for essential industries experiencing growing needs and high attrition rates, such as health care, education, and civil service

In 2021, ESD charged New York State's (NYS) 10 Regional Economic Development Councils (REDCs) with developing a Regional Workforce Inventory (Inventory or Phase I) that identified the following:

- ▶ Each REDC's priority tradeable sectors
- ▶ The most in-demand skill sets needed by employers
- ▶ Populations for whom workforce training is most needed
- ▶ Wraparound services needed to lower workforce entry barriers

In addition to benchmarking each region's post-pandemic workforce needs, Phase I laid the groundwork for the potential allocation of multi-year funding, which includes \$150 million in grant programs designed to support employer-driven, high-skilled workforce training programs.

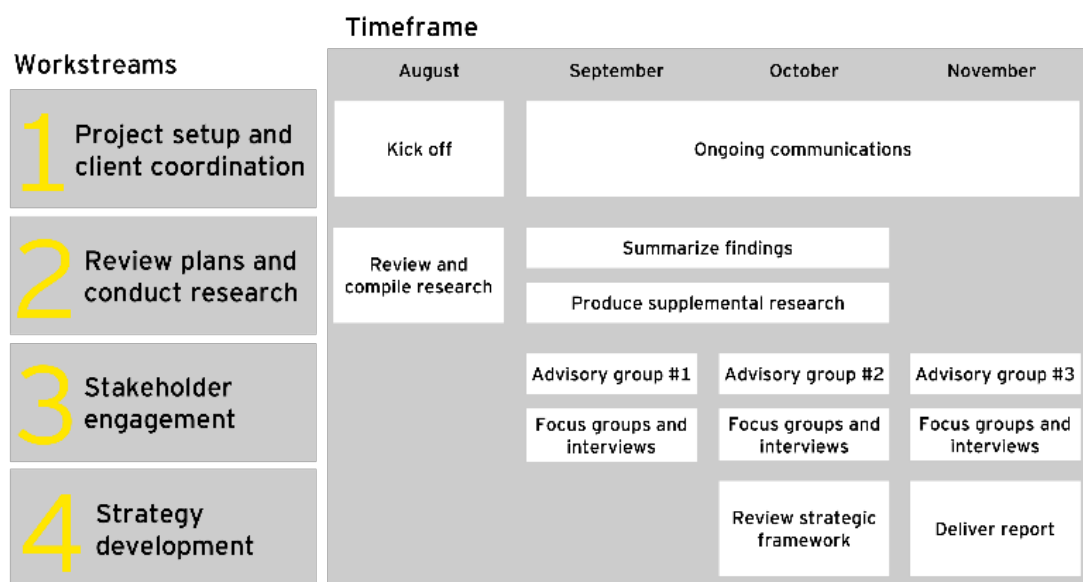
Phase II objective

In August 2022, ESD retained Ernst & Young LLP (EY) to aid the Southern Tier Regional Economic Development Council (STREDC) with validating and building upon the work completed in Phase I and aligning STREDC's work with ESD's goals, objectives, and statewide strategy for economic development.

In Phase II, EY, in partnership with Stragility, LLC. (a NYS Certified WBE), was tasked with developing sector-specific workforce strategies that provide a roadmap for how to address the workforce issues identified for STREDC's targeted tradeable sectors. More broadly, the strategies seek to promote the overall economic health of the region, increase the resiliency and size of the labor market for employers, and serve the underserved and underrepresented populations.

Process

The process for Phase II included four workstreams occurring over three months. Those workstreams are illustrated below.



Over the course of the engagement, EY maintained ongoing communication with STREDC and ESD to provide status updates, plan meetings, and track progress.

Industry selection

When considering the industry sectors to prioritize in a workforce development strategy, EY supported STREDC in evaluating how the region's inventory of established tradeable sectors performs against the following criteria:

- ▶ Alignment with ESD's statewide target industry sectors
- ▶ Best use of Southern Tier's current and planned future assets and tools
- ▶ Support for Southern Tier goals and values
- ▶ Regional labor force and employer needs
- ▶ Minimal barriers to entry for unemployed, underemployed, and underserved
- ▶ Projected job growth (positions and wages) in the sector

Industry selection (continued)

Of the four tradeable sectors identified in Phase I, STREDC and its advisory committee agreed to focus their regional strategies in support of the Advanced Manufacturing and Agribusiness industry sectors. The North American Industrial Classification System (NAICS) codes associated with these sectors were defined by the New York Department of Labor and provided to the EY team by ESD. These are provided in the data appendix.

The targeted industries of Advanced Manufacturing and Agribusiness operate regional employment pipelines that have the potential to bridge high-wage occupations with current and future job seekers that may be unemployed, underemployed, and underserved. The diverse basket of goods grown, manufactured and assembled in the Southern Tier is consumed on a global scale, which bodes well for the industry sectors' resilience.

Background review

To begin the project, EY conducted a background review of documents provided by STREDC to better understand the workforce and target sectors of the Southern Tier region, as well as recent economic development priorities and achievements for the region and the REDC.

The following is a non-exhaustive list of materials provided to and reviewed by EY:

- ▶ Southern Tier Progress Report, Phase I (2022)
- ▶ Southern Tier 2021 Annual Report (2021)
- ▶ 2020-2025 Tioga County Workforce Development Strategy (2020)
- ▶ Broome County Agricultural Economic Development Plan (2019)
- ▶ Broome Talent Taskforce 2020 Strategic Workforce Plan (2020)
- ▶ Southern Tier Business Workforce Survey Results (2022)
- ▶ Alliance for Manufacturing Report on Manufacturing Skills Needed in the Southern Tier (2022)
- ▶ Broome-Tioga Workforce NY Department of Labor Local Plan (2021)
- ▶ New Energy New York Build Back Better Regional Challenge Proposal (2021)
- ▶ Team Tioga Annual Report (2020)
- ▶ New York Manufacturing Extension Partnership Report (2021)
- ▶ REDC Phase II Guidance, New York State ESD/OSWD (2022)

Supplemental data analysis

While the Phase I: Inventory provides a sound foundation for direction, further quantitative research was needed to validate those findings and the findings from the surveys conducted in partnership between New York State and the Business Council of New York State.

The following were suggested for supplemental research and are provided as an appendix to the final report:

- ▶ Regional workforce conditions
- ▶ Industry analysis on the two target sectors: Advanced Manufacturing and Agribusiness
- ▶ Occupational analysis of the two target sectors
- ▶ Educational programming that supports overall workforce development and the programming specific to the two target sectors

Stakeholder engagement

To supplement the analysis and findings from Phase I and Phase II, EY collaborated with ST REDC and its advisory committee to identify employers, industry associations, training providers, community-based organizations, wraparound service providers, educational institutions, labor unions and other relevant stakeholders across the Advanced Manufacturing and Agribusiness industry clusters. These groups were invited to participate in focus groups and interviews during October.

Focus group and interview list

Industry focus groups	Ecosystem partners focus groups	Interviews
Advanced Manufacturing (2)	Government partners (2)	Advanced Manufacturing partners (6)
Agribusiness (2)	Non-Profit/social services partners (2)	Battery manufacturing consortium partner
	Higher education	Non-profit advocate for manufacturing

Advanced Manufacturing

A workforce development strategy
for the Advanced Manufacturing
industry in the Southern Tier





Advanced Manufacturing Research findings

Industry overview

The ST REDC selected Advanced Manufacturing as one of the two industries to receive a workforce strategy based on its potential for unemployed, underemployed, and underserved jobseekers, as well as its ability to promote resiliency in the regional economy.

The Advanced Manufacturing industry has a long legacy in the Southern Tier and some of the greatest potential for growth. The industry employs nearly 17,500 people and represents a diversity of companies from advanced materials to transportation to clean energy. While employment numbers have declined in recent years, the sector is positioned for reinvigoration: In fall 2022, Binghamton University was awarded \$63.7 million through the American Rescue Plan's Build Back Better Regional Challenge. The investment will establish the region as a national center for battery technology and manufacturing.

Workforce challenges are plaguing the Advanced Manufacturing industry, both in the Southern Tier and across the nation. From an availability standpoint, the regional labor force participation rate is much lower than the state average, especially for minorities who are less likely to be in the labor force and face higher unemployment rates. There is also a larger proportion of people with disabilities in the region and an aging workforce. Addressing these current and future talent needs will be integral to the long-term success of Advanced Manufacturing in the region and will require a diverse array of awareness, outreach, training and support services for both the workforce and industry.

Advanced Manufacturing presents a valuable opportunity for potential jobseekers, including those that are currently disengaged from the workforce or underemployed, like the nearly 30% of households that are Asset-Limited, Income-Constrained and Employed (ALICE).¹ The industry has low barriers to entry, plenty of growth opportunities and higher than average wages. For all these reasons and more, Advanced Manufacturing continues to be a key tradeable sector for the Southern Tier.

¹ Source: UnitedWayALICE.org Research Center, New York-Household Budgets 2018, United Way of Northern New Jersey Corporation

Workforce analysis

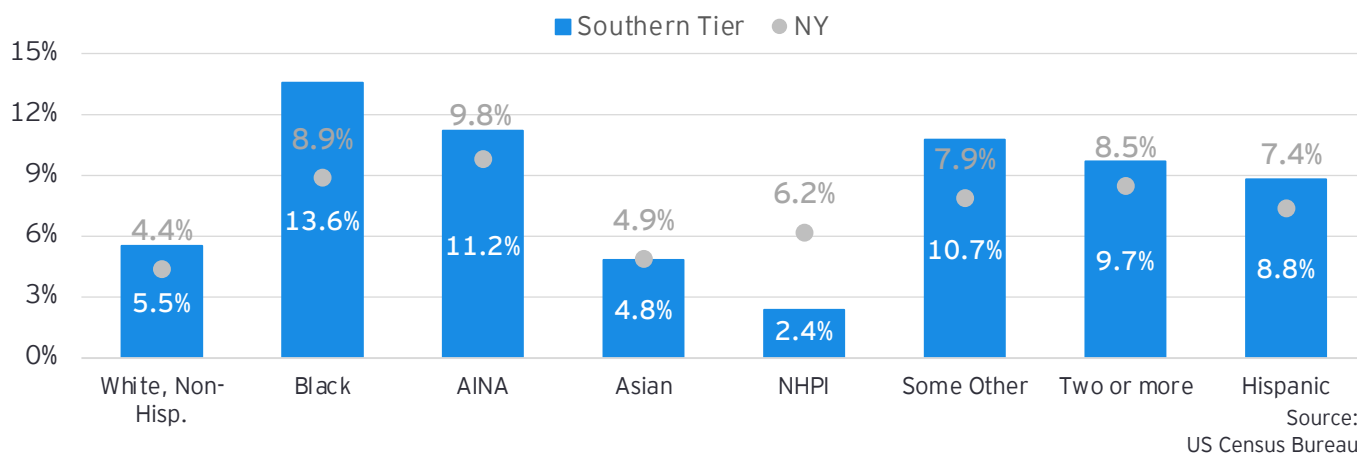
Population trends by year, age, and race/ethnicity, in particular, provide actionable insights on the region's ability to supply the labor needed to support the Southern Tier's economy.

Unemployment and labor force participation

- ▶ Unemployment rates have steadily declined since the height of the pandemic, and now hover around 3.7%, which is slightly less than the state average.
- ▶ Labor force participation is much lower in the Southern Tier than the state average. Less than 60% of residents of working age (16+) are in the labor force (either working or looking for work).
- ▶ Minorities in the Southern Tier have lower workforce participation rates and higher unemployment rates, with a few exceptions.
- ▶ Educational attainment seems to play a factor in employment as well, as unemployment rates decrease and labor force participation rates increase with each increase in level of education attainment.

The region has an opportunity to increase minority participation in the workforce

Unemployment rate by race/ethnicity, 2020



Population trends

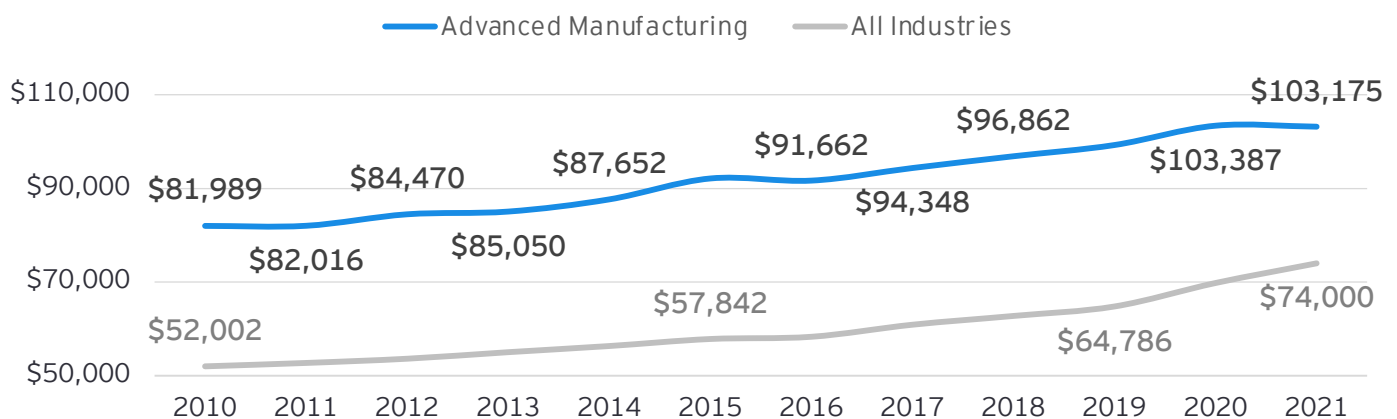
- ▶ Of the eight counties in the Southern Tier, Tompkins County was the only one with a population increase over the past 10 years (3.3%). Broome County experienced the smallest decline (-1.1%) while Chenango saw the largest (-7.3%)
- ▶ The Southern Tier has an aging workforce: the retirement age population (65 years old or older) has grown the fastest of any age group over the past five years (6%), followed by those 25 to 44 (5%) and those 15 to 24 years (2.6%). The 45- to 64-year-old age group declined significantly (-8.6%).
- ▶ The population of Southern Tier is predominantly white. Minority populations are three to four times proportionally smaller in Southern Tier versus state averages. Still, the population of Southern Tier is becoming more diverse, with high growth in Hispanic, other, and Black populations. The white (non-Hispanic) population is declining.
- ▶ The Southern Tier region has a much higher share of teenage and college-age populations (15 to 24 years old) than the statewide average (17% vs. 12%, respectively), but a much lower share of young professionals (25 to 44 years old) by nearly 4 percentage points.

Industry analysis

Examining the overall trends facing the Advanced Manufacturing industry sheds light on the region's competitiveness to recruit, expand, and retain high-impact businesses that invest in the tax base. Equally important, these enterprises present an opportunity to offer high-quality, in-demand jobs for Southern Tier's unemployed, underserved, and underrepresented populations.

- ▶ There are more than 17,400 jobs in Advanced Manufacturing in the Southern Tier region. Employment within Southern Tier's Advanced Manufacturing sector is concentrated in Semiconductor and Electronic Components, General Purpose Machinery, and Instrument Manufacturing. Railroad Car manufacturing added the most jobs because of recent industry investments in the region.
- ▶ Total jobs in Advanced Manufacturing declined nearly 21% over the last 10 years but was largely unaffected by the pandemic. At just over 200 businesses, the number of Southern Tier companies in subsectors has been relatively stable over the past five years. Most new companies were created in Instruments (NAICS 3345).
- ▶ Potential earnings in the Southern Tier region's Advanced Manufacturing sector are high: In 2021, the average annual earnings amounted to \$103,175 compared with a \$74,000 average across all industries.
- ▶ The fastest-growing Advanced Manufacturing subsectors in Southern Tier are Metals and Chemical Manufacturing. Transportation Equipment and Mineral Products are also growing. Southern Tier has a large Computer/Electronic cluster (including a per capita concentration 3.4 times the US average), but employment is falling.
- ▶ Southern Tier's Advanced Manufacturing workforce is aging. A majority of the Southern Tier region's Advanced Manufacturing workforce is 45 years or older, and entry-level and prime working age segments of the Advanced Manufacturing labor force are below the regional average for all industries.
- ▶ Females are underrepresented in the Advanced Manufacturing workforce, as male workers in Southern Tier account for nearly three-quarters of the industry workforce.

Average annual earnings, 2010 - 2021



Source:
Lightcast

Earnings in Advanced Manufacturing are significantly higher than the regional average

Occupational analysis

Talent development requires coordination amongst employers, educators, and training facilities. Maintaining a system-wide understanding of staffing patterns, typical entry level education, and potential earnings helps to preserve a talent pipeline that's responsive to the needs of employers and job seekers.

- ▶ Advanced Manufacturing offers low entry requirements, as a majority of entry-level jobs only require a high school diploma or equivalent. The median hourly earnings for a job requiring a high school diploma or less is \$21.08.
- ▶ A large number of Southern Tier workers in Advanced Manufacturing are in general assembly, electrical assembly, inspectors, and clerks. Bachelor's-level demand is highest for industrial engineers and software developers. Few jobs require an associate degree.
- ▶ Of the positions requiring some college or an associate's degree, most Southern Tier jobs in Advanced Manufacturing are for industrial and electrical technicians, bookkeepers, mechanical drafter, computer support, and truck drivers.
- ▶ Of the positions requiring some college or an associate's degree, most Southern Tier jobs in Advanced Manufacturing are for industrial and electrical technicians, bookkeepers, mechanical drafter, computer support, and truck drivers.
- ▶ For positions requiring a bachelor's degree, most Southern Tier jobs in Advanced Manufacturing are for industrial engineers, software developers, operations managers, and mechanical engineers.

Educational programming observations

A region's ability to produce talent across the entire labor spectrum is closely linked to its ability to sustain economic growth. Analyzing the output from the Southern Tier region's educational programming provides insights on labor shortages, misalignment with employer needs, and clarity into workforce development investments.

General

- ▶ The population in the Southern Tier is educated evenly across postsecondary levels, with 12% to 17% of adults having some college, an associate's, a bachelor's, or a graduate degree. Over 40% of adults have a high school diploma or less.
- ▶ More students in Southern Tier are full time than seen across the state (6% more are full time locally). Conversely, the region has a much smaller share of part-time students (22.3%) and graduate students (19.1%) enrolled in higher education institutions compared with the state (28% and 19.5%, respectively).
- ▶ Educational institutions in the Southern Tier significantly underproduce (accredited) certificate-level graduates in Advanced Manufacturing and overproduce bachelor's graduates. Regional degree production is concentrated at the baccalaureate and graduate level: Over 85% of all accredited certificates and degrees produced in the Southern Tier are at the bachelor's level or higher.
- ▶ Most college graduates in the Southern Tier get degrees in Business or Engineering at the bachelor's level or above. Health graduates are the third-highest output and include graduates with associate's and some certificates. Other large programs include Computer/IT, Biological Sciences, and Social Sciences.
- ▶ Graduate increases are highest in the Southern Tier in Health and IT programs. Bachelor's degrees in IT increased by over 300 graduates over the last five years. Master's in Business grew by 220 graduates, and bachelor's in Biology grew by 151. Some declines at the associate's level (Business and Liberal Arts) may reflect a change in institutional offerings.
- ▶ Accredited certificate production is highest for one-year programs (93.8%), and few short-term programs are available.

Educational programming observations

Industry-specific

- ▶ Our gap analysis shows certificate-level positions (at accredited institutions, not including non-profits) are significantly underserved by local programs, which may suggest manufacturers are reliant on for-profit educators or on-the-job training. **Welding** has the largest production of graduates (33) and a handful of **Machinist** graduates. **Industrial Production Technicians** and **Industrial Machinery Maintenance** have zero graduates.
- ▶ At the associate's level, **Industrial Engineering Technicians** are underproduced in the region, but **Electrical/Electronic Technicians** appear to produce enough graduates, as many workers learn their skills on the job. Bachelor's-level positions are well-served, as the region overproduces graduates across several **Engineering, Accounting, and Software/IT** programs, suggesting many graduates leave the region upon graduation.
- ▶ **New registered apprentices have more than doubled in the Southern Tier since 2016 and are currently at their highest levels but are underutilized for manufacturing.** New apprenticeships are concentrated in the skilled trades: electrician programs are the top apprenticeship program within the region followed by painters, construction and maintenance. Electrical programs experienced the most significant growth followed by glaziers

Supply-Demand Gap Conditions Advanced Manufacturing, Southern Tier

		Avg. Educ.	Regional 2021		Regional	Supply-demand
Gap	Occupation Group	Level	Job Openings	Graduates	Ratio	Ratio versus US
Lg Shortage	General Machinist	Certificate	206	5	2%	22%
	Industrial Production Technicians	Certificate	133	0	0%	0%
	Industrial Machinery Maintenance	Certificate	92	0	0%	0%
	Welders	Certificate	108	33	31%	39%
Shortage	Electrical / Electronics Technicians & Di	Associate's	45	28	62%	229%
Shortage	Industrial Engineering Technicians	Associate's	59	27	46%	49%
In-Balance	Accountants & Tax Examiners	Bachelor's	171	318	186%	384%
	Electrical and Electronics Engineers	Bachelor's	44	368	841%	671%
	Engineering Managers	Bachelor's	24	13	54%	105%
	Industrial Engineers	Bachelor's	70	192	275%	374%
	Mechanical Engineers	Bachelor's	70	505	718%	421%
	Software Developers	Bachelor's	183	1,054	575%	1815%
	Computer Systems & Information Securi	Bachelor's	98	438	446%	492%

Lg Shortage Shortage In-Balance Over-Supply Lg Over-Supply

Source:
EY analysis of data from Lightcast and US Dept. of Education

Ecosystem observations

An initial framework was developed to help assess the strengths, challenges, and opportunities across the Southern Tier's regional workforce development ecosystem. This framework focused on the areas of 1) industry-informed training, 2) awareness of opportunities, and 3) wraparound services and support. The following illustration outlines the types of work within each of those focus areas.



It is important to note that the Southern Tier region is broad and diverse with multiple population and employment centers spanning the eight-county region. Some of these subregions are better organized and resourced in their support of workforce and the target industries.

Industry-informed training

Strengthening relationships between employers and the talent pipeline is a central component of OSWD's approach to workforce development. Alignment of industry needs with career readiness, on-the-job training, and reskilling activities may expand the career pathways and pipeline for all segments of the labor force.

- ▶ There are numerous institutions and training facilities across the Southern Tier whose offerings range from adult education to post-graduate degrees. The level of industry engagement within these institutions varies across the region, by program and by size of employer.
- ▶ Large manufacturers have established tools for attracting, developing, and reskilling talent to include internal training programs and strong external partnerships with local universities, community colleges and the Boards of Cooperative Educational Services (BOCES).
- ▶ The Alliance for Manufacturing and Technology provides support for small to medium-size manufacturers in the Southern Tier, but many of these manufacturers have expressed a desire for more support for industry-led training. However, these same manufacturers are unsure how to do so or whom to engage. They also may not have the resources or capacity to pursue programs to reskill their labor force or onboard talent from non-traditional sources.
- ▶ Government and private/non-profit organizations are collaborating to support the workforce needs of the energy storage cluster as outlined in the recent Build Back Better Regional Challenge (BBBRC) application. Some businesses in the region have made commitments to participate in the New Energy New York internship and apprenticeship initiatives, but they expressed challenges in establishing and supporting these programs.

Ecosystem observations

Awareness of opportunities

Innovation within the Advanced Manufacturing industry has advanced the means of production to include a wide range of career opportunities, yet the perception of the old ways of manufacturing persists. Clear definition of stakeholder roles, the target audience, and methods of promotion may increase awareness and participation within Advanced Manufacturing.

- ▶ The limited awareness, negative perceptions, or perceived inaccessibility of jobs in the Advanced Manufacturing industry may require proactive marketing and promotion of career opportunities.
- ▶ Events like Manufacturing Day/Month, Trades Days, and plant tours seek to raise awareness for opportunities in the sector. There is an opportunity to build on this with more frequent, coordinated, and tailored communications.
- ▶ At least one subregion has developed a coordinated program for building awareness and engaging students in career opportunities, especially in STEM-based occupations. There is an opportunity to establish and launch more campaigns and activate a more comprehensive, sustained effort.
- ▶ The regional workforce boards are providing assistance to select sectors and for target populations, but alignment and awareness of services could be improved, according to stakeholder input.
- ▶ The region's chambers, economic development organizations, and the industrial development agencies (IDA) provide another layer of connectivity between employers, educators, government partners, and non-profits, but the resources and level of engagement vary across the region, and coordination will be important moving forward.

Wraparound services and support

Socioeconomic barriers may hamper target populations' ability to complete a career-advancement program, obtain or retain a job in Advanced Manufacturing, or participate in the labor force. Addressing these impediments through services and programs may unlock opportunities for hidden talent in the Advanced Manufacturing industry.

- ▶ Limited available childcare spots (especially for infants), high cost for parents, and low wages for caretakers make it difficult for some residents with children to enter the labor force.
- ▶ Compared with New York State, the Southern Tier is a vehicle-reliant region where 76% of commuters rely on personal vehicles to get to work. The region could benefit from an enhanced public transportation system.
- ▶ A shortage of wraparound support services often inhibits untapped talent from workforce and/or training entry, and both job seekers and employers may struggle to navigate the available resources. Additionally, potential job seekers that have been out of the workforce sometimes require coaching to prepare for a job and mentoring once employed. Past Community Navigator programs have sought to bridge this gap but do not have sustainable funding or enough capacity to support the need.

Advanced Manufacturing Strategy framework

Industry overview

With the insights gathered through the background review and stakeholder engagement process, the following strategic framework was developed as the foundation of a sector-based workforce development plan.

The strategic framework comprises four goals, each with considerations that clarify the direction Advanced Manufacturing leaders could pursue to achieve the goal. Within each goal, an assessment of activities identifies areas that are primed for change or investment. Opportunities are presented as potential solutions, which may be taken to address stated challenges and realize the goal.

Goals

1

Enhanced regional coordination in Advanced Manufacturing.

2

Excitement for careers in Advanced Manufacturing.

3

Expanded training and wraparound services for underserved populations.

4

Establish pathways to direct employment and growth opportunities.

Target populations



Asset-Limited,
Income Constrained,
Employed (ALICE)



Individuals outside
of the workforce



Talent outside of college
bound students



Graduates from local
colleges and universities



Incumbent
workforce

Goal 1: Enhanced regional coordination in Advanced Manufacturing.

Investments in workforce and economic development have been increasing over the last decade, and exponentially so with the rollout of federal relief programs like the American Rescue Plan.¹ This increase in funding illustrates the level of importance the nation and individual states put on solving the current talent shortage. However, as the attention and funding streams for workforce development increased, more organizations entered into the broader workforce ecosystem. Unfortunately, coordination and alignment of these organizations have not kept pace. While additional programming and funding are positive, it has also created confusion in the market for employers, potential jobseekers and everyone in between as to who to contact for help. The time has come to take pause and inventory what programs exist, what funding is available and how resources could be used more effectively.

This is also a unique time for employers in Advanced Manufacturing. Significant industry transformation is underway; five generations are in the workforce; there are increasingly diverse populations; and many are still recovering from the pandemic. Managing talent in this environment can be challenging, to say the least. Leaders in manufacturing need a resource for understanding these various dynamics and what resources and leading practices exist to create a more competitive work environment. Enhanced industry support and regional coordination are two complementary solutions for engaging and supporting employers in building stronger talent pipelines in Advanced Manufacturing.

The recent announcement of **New Energy New York's** winning application for the **Build Back Better Regional Challenge** will likely translate to increased resources and attention in the region's broader workforce ecosystem, especially given the program's focus on inclusive workforce development. **While New Energy New York covers only a segment of the region's Advanced Manufacturing industry, the infrastructure it will need to achieve its goals could be spread industry and region-wide. Regional collaboration and coordination are encouraged.**

Here are some considerations on regional and industry coordination:

- ▶ Inventorying and assessing the programs, targets and funding sources of all partners in the workforce ecosystem is a critical first step in identifying gaps and opportunities and in aligning efforts moving forward. A better understanding of the available resources and their limitations will also support more effective allocation of these funds.
- ▶ The talent challenges facing employers today will likely not be solved by one entity alone. Solutions will require coordination and contributions from a host of partners involved in the entire workforce ecosystem – employers, educators, community-based organizations/non-profits and government organizations, to name a few.
- ▶ To better understand the talent ecosystem, employers will need accessible, real-time information on available training programs and resources, plus leading practices on talent management, leadership, and new industry dynamics.
- ▶ Given the complexities of navigating the ever-changing ecosystem, several communities have employed workforce development coordinators to serve as concierges to employers' talent needs. This is in addition to the standard business retention and expansion support (BRE).
- ▶ A single entity, like a manufacturers association, is often charged with convening employers, educating them on relevant industry topics, activating shared initiatives, and advocating on their behalf. To be effective, these associations require adequate funding and staff.

¹ Source: *Jacob Stenstrom, State Investment in Workforce Development on the Rise*, The Council for Community and Community Research, October 9, 2019

Assessment of regional coordination and industry support in the Southern Tier

Regional coordination and industry support were common discussion points shared in our stakeholder conversations. Some key observations include:

- ▶ Workforce development programs offered in the Southern Tier and its subregions are largely unknown, even among stakeholders within the same ecosystem. Without an inventory, there may continue to be a duplication of services, unaddressed gaps in the ecosystem, and job seeker/employer fatigue.
- ▶ The nuances within the Southern Tier's many subregions and labor markets may present a challenge in making real-time assessments of employer needs, talent supply, and wraparound services. Similarly, information, leading practices, and resources aren't easily disseminated or shared across regions. The varying and overlapping territories of workforce development agencies serving the region seem to compound this issue and its ability to mobilize systems change.
- ▶ The region could benefit from better-resourced manufacturing association. While consortiums (e.g., Alliance for Manufacturing and Technology, local chambers of commerce, and economic development organizations) provide advocacy and services on behalf of manufacturers, their funding, staffing, and capacity to sustain broader regional industry coordination is limited. As such, many manufacturers have limited awareness and available resources to dedicate to engaging with educators and traditional work-based learning, such as internships and registered apprenticeships.
- ▶ Employers lamented the disconnect between the local workforce development boards, school districts, BOCES, and community colleges. Due in part to the fragmented workforce development ecosystem, larger manufacturers have turned to sourcing talent from other companies and making investments in in-house workforce development initiatives. Without coordination across the ecosystem, especially across the pre-employment and upskilling partners, smaller employers and job seekers may continue to face opportunities.

Possible opportunities

The following are opportunities that the Southern Tier could explore to enhance regional coordination and support of Advanced Manufacturing:

▶ **Support for a fully-resourced manufacturers association with a complete suite of services.**

Industry associations provide a platform for employers of all sizes to convene for discussions on leadership, talent, current skills needs, and changing industry dynamics. It can also be a platform for sharing leading practices, activating shared initiatives, and enhancing overall collaboration. Such an organization could also take ownership of much of this strategy.

Sample initiatives they could tackle:

- Identification and awareness for engagement opportunities (e.g., industry ambassador programs, networks/initiatives for diverse populations, shared apprenticeships)
- Ongoing skills needs/assessment
- Education and trainings for how to be an "employer of choice" (e.g., company culture, cultural understanding, flexible work arrangements)

Potential partners: Industry employers, current local and statewide industry associations to include the regional Manufacturing Extension Partnership (MEP) Center, local chambers, economic development organizations (EDOs) and IDAs

The Manufacturers Alliance, a coalition of eight regional manufacturing associations, supports companies with recruiting, upskilling, and retaining talent through the NYS Registered Apprenticeship program. Any manufacturing association developed in the Southern Tier could explore joining the Manufacturers Alliance to scale potential solutions.

► **Establish a workforce consortium with representatives from all parts of the workforce development pipeline.**

A workforce consortium allows for all entities engaged in the workforce pipeline to convene for awareness and assessment of current challenges and opportunities and be a platform for enhanced collaboration. This could include non-profits and social services organizations providing wraparound services and support for target populations, training centers and educational institutions, and government-supported workforce agencies, to name a few.

The consortium can include regional and subregional workgroups. The workgroups could take on the role of asset mapping, identifying roles for the workforce ecosystem, standardizing outcomes, and convening stakeholders to align workforce development activities around the needs of industry.

The GST STEM Academy is a strong example of the potential output from a collaboration among Corning-area businesses, high schools, and community colleges.

Potential partners: REDC, government-affiliated workforce development agencies, education partners and training institutions at all levels, industry employers and associations, IDAs and economic development organizations engaged in workforce development, non-profits and social services

► **Identify a lead workforce development entity in each subregion.**

A regional or group of subregional designated workforce development organizations could provide the coordination necessary to activate elements of this goal area and support other industry strategies, but a feasibility study would need to occur first to assess the needs and capacity for supporting such an initiative. The designated regional or subregional organizations could take on the role of asset mapping, identifying roles for the workforce ecosystem, standardizing outcomes, and convening stakeholders to align workforce development activities around the needs of industry.

Potential partners: REDC, government-affiliated workforce development agencies, IDAs, local chambers and economic development organizations engaged in workforce development

► **Develop a regional inventory and assessment of existing workforce programs, programs for target populations, and funding sources.**

A high-priority task for the identified region or subregional workforce leads would be to develop a comprehensive inventory that could be used to create an asset map of resources for potential job seekers and employers but could also be the foundation for an assessment that maps training in the tradeable sector, general workforce support, funding sources, program targets, and programs in an effort to identify gaps and challenges and ways to utilize resources most effectively.

The New Energy New York consortium convened a workforce development group that included local universities, local workforce development boards, community colleges, and employers to inventory training programs and gaps based on industry needs to support the energy storage cluster labor force. Similar efforts should occur in the Southern Tier's subregions and employment centers for the broader Advanced Manufacturing industry.

Potential partners: Government-affiliated workforce agencies, social services organizations and non-profits, and education and training providers and identified regional/subregional organization

► **Expand workforce coordinator roles to support Advanced Manufacturing.**

To better understand the talent ecosystem, employers will need accessible, real-time information on available training programs and resources and a concierge for navigating them. These coordinators, which already exist in several IDAs across the region, can serve one or many industry sectors. A structured training program for these coordinators would also be beneficial.

A priority task for the workforce consortium and/or workforce coordinators would be to create a shared agreement for how outreach is conducted, and employer needs assessed and addressed. An information sharing agreement and/or system could also reduce the number of duplicative meetings to one company.

Potential partners: REDC, government-affiliated workforce development agencies, IDAs, local chambers or EDOs involved in workforce development, industry associations, education partners and training institutions at all levels



Connecticut establishes business ambassadors

The Connecticut Department of Economic and Community Development is enlisting the support of eight statewide ambassadors to conduct outreach in its target industries. These ambassadors are intended to address needs related to growth and expansion plans, talent needs and transportation access, to name a few. The program is also meant to provide a more coordinated response to industry needs so businesses are not being asked the same question by multiple entities. Data sharing, through a customer relationship management system (CRM), is one example of this more coordinated approach.



Goal 2: Excitement for careers in Advanced Manufacturing.

Limited awareness and misperceptions surrounding career opportunities was a resounding theme across the Southern Tier region. This issue was expressed across industry sectors and by employers large and small. It was also noted as a shared concern across all four regions served by EY during this project and is recognized as a nationwide issue as well. Its prominence across the regions, sectors and employers suggests that it not only be a top priority for the Southern Tier region but for the state, as a whole.

The need for greater awareness of the career and growth opportunities within these target sectors is primarily focused on the K-12 talent pipeline but extends further to those seeking to re-enter the workforce or considering a career change.

Here are some considerations when focused on the K-12 pipeline:

- ▶ Awareness and exposure can start at an early age with the level of employer engagement increasing over time as the students reach junior high school.
- ▶ The misperception of certain career opportunities by school administrators, teachers, and career counselors could impact students' awareness and access to valuable training and opportunities.
- ▶ Parents should not be overlooked in awareness efforts, as they often play an important role in guiding their child's future career and educational decisions.

For all audiences:

- ▶ Content should be exciting to interest students and potential job seekers in engaging in further exploration.
- ▶ Misperceptions will need to be addressed head on, both in aspects of the job and work environment and a person's ability to do the job, due to skills, resources, and networks.
- ▶ Peer experience is viewed as an effective method for helping both students and potential job seekers see themselves in an opportunity. These ambassador-type programs have been popular for the last several decades and with social media, have the potential for an even greater reach.
- ▶ Career opportunities can be a driver for talent attraction and retention efforts, but the promotion of the region/communities and its livability are also important. Many communities package this information in a live, work, and play framework.

Assessment of career awareness for Advanced Manufacturing in the Southern Tier region

Awareness was one of the key aspects of the workforce ecosystem explored during our research on the region and in conversations with regional stakeholders.

Our main takeaways from that research were as follows:

- ▶ Employers have an important role to play in this and every goal. Their presence and engagement in the community, participation in career awareness events and support of employees engaging in ambassador programs are integral in creating more excitement for local careers opportunities.
- ▶ Campaigns that promote career awareness in the tradeable sectors vary across the Southern Tier's many job centers, labor markets, and major employers. A more coordinated, centralized approach could surface leading practices and elevate industry profiles in the Southern Tier region.

- ▶ Smaller enterprises may not have the capacity to advance industry awareness, while larger enterprises have reported bypassing local workforce development efforts in lieu of nationally recognized campaigns. A rightsized, coordinated outreach strategy could connect businesses with regional programs and organizations that promote career awareness, such as the SPARK Career Fair, the PEAK Program, and the local BOCES.
- ▶ Pockets of the region have invested in regional branding campaigns and marketing platforms (e.g., Broome is Good and Roam the Empire). The promotion of lifestyle and career opportunities are becoming increasingly necessary in communities of all sizes.
- ▶ Reaching and engaging the target populations will likely necessitate a well-resourced multi-media campaign and interactive platform for promoting careers and educational opportunities in the target sectors. An initiative of this size could be led at the state level with ties to regional resources and opportunities.
- ▶ In addition to any statewide resources, there are toolkits and initiatives sponsored by national manufacturing associations for promoting careers in their sector. These often include networks, events and competitions, sample activities and curriculum suggestions, and toolkits for promoting the sector. The region should leverage these publicly available resources when possible.

Potential opportunities

The following are opportunities the Southern Tier could explore to increase awareness and excitement for career opportunities in its targeted sectors.

▶ **Develop statewide multimedia campaign in select targeted sectors.**

These campaigns could include testimonials from peers, videos showcasing companies, and occupations and virtual reality experiences, to name a few. Content should be optimized for various media channels and sharing platforms.

Ideally, this content could be developed at the state level, focusing on the economic mobility of identified industry sectors, followed by regional campaigns supporting specific industry sectors. The goal of a campaign would be to dispel myths, create momentum, and generate interest in manufacturing careers.

Potential partners: NYS ESD, NYS DOL and other government affiliated workforce agencies, major industry associations, employers

▶ **Launch an interactive website to showcase pathways, opportunities, and resources.**

Any multimedia campaign could direct students, parents, and potential job seekers to a landing page to further explore statewide or regional information on sector opportunities. Content should be well-designed and engaging and target specific audiences.

Potential partners: NYS ESD, NYS DOL and other government affiliated workforce agencies, REDC, major industry associations, employers, training and education partners



South Carolina Future Makers

The South Carolina Manufacturers Alliance launched a public-private partnership to increase engagement between the state's manufacturing companies, technology communities and students in middle school, high school, technical college and four-year college, plus their parents. The initiative showcases the many paths and opportunity within manufacturing.

► **Adapt and replicate frameworks centered on career awareness throughout the region.**

A regional plan for employer engagement and career awareness initiatives for the K-12 pipeline could also include a plan for job shadowing, pre-apprenticeship programming, and resource sharing. Designed in partnership with industry, this plan could detail how to coordinate and build upon critical education curriculum within the tradeable sectors. The audience would include administrators, career counselors, parents and students. In some instances, new programs could be piloted in one district or school then scaled accordingly. Regional consortiums should consider leveraging existing programs such as SPARK and PEAK in Broome and Tioga counties, which seek to increase career awareness, exploration, and preparation in careers with upward mobility.

Potential partners: NYS DOL and government affiliated workforce agencies, NYS Education Department, NYS School Boards Association, school districts, BOCES, P-TECH, major industry associations, employers

► **Establish local ambassador training programs.**

Industry ambassadors can provide a deeper connection to the reality of a potential job opportunity. A regional program utilizing industry representatives as proponents of advanced manufacturing careers could train and deploy others with the faces, voices, and stories of local communities and target populations. Their stories are most powerful when told in person and could be featured in marketing materials. The Southern Tier's population is growing in diversity and could benefit greatly from scaling existing programs that are focused on better understanding the needs of various cultures. In addition, reaching individuals through community and faith-based organizations with the message of attainable employment pathways can prove to be effective.

Potential partners: Industry associations and employers, local chambers and economic development organizations



Pennsylvania Advanced Manufacturing Ambassadors

A new program will fund teams of industry ambassadors to visit select high schools, trade schools and community colleges and spark interest and awareness for manufacturing careers among students, teachers and administrators.

► **Expand dual enrollment, job shadowing, experiential learning and pre-apprenticeship programming.**

Promoting and scaling dual-enrollment programs in technical disciplines can create accelerated pathways for high school graduates who are not university-bound. Coupled with job shadowing, experiential learning, and pre-apprenticeships, this approach could positively impact the industry's ability to attract more students. The challenge here is to connect these events back to actual career opportunities. Employer engagement is key to making this connection.

The Greater Southern Tier STEM Academy is successful example of collaboration between education and industry partners that leads to better career opportunities, especially for more vulnerable students.

Potential partners: BOCES, P-TECH, school districts, employers, and industry partners

Goal 3: Expanded training and wraparound services for underserved populations.

In the Southern Tier, only 58% of working-age residents are working or looking for work (compared with 63% in New York). Such a low number means a large segment of the Southern Tier's potential labor force may face systemic barriers to obtaining and retaining a job in the tradeable sectors. Regional leaders noted poor health and issues with substance abuse as possible contributing factors to lower labor force participation rates, and are targeting incumbent workers, veterans, underemployed young adults, justice-involved individuals, individuals in recovery or with a disability, and traditionally marginalized populations as targets for training that is integrated with wraparound services to improve their economic opportunities.

Often, these groups have limited information or awareness of the available career pathways. and when upskilling or job opportunities are presented, potential job seekers may require a package of services and support to forgo short-term gains (e.g., unemployment benefits, low-wage, non-career jobs) in exchange for long-term success. Bringing more potential job seekers into careers in the Advanced Manufacturing, especially in historically marginalized communities, will necessitate an alignment of awareness, opportunity, and wraparound support.

Here are some considerations for aligning these efforts:

- ▶ **Wraparound services should be easy to navigate and access**, especially for unemployed, underemployed, and historically marginalized communities.
- ▶ **Some populations require unique resources and supports** to address challenges related to education and skill level, language, culture, legal or health issues. Some of this training may need to occur prior to a short-term program.
- ▶ Potential job seekers may respond more positively to **human-centered assistance that helps them navigate** the wraparound services offered in the region.
- ▶ It is common for wraparound services to be created and deployed independent of corresponding training programs. For the highest participation and awareness among vulnerable populations, the **embedding of wraparound services should be a part of short-term training programs**, and the necessary collaboration to accomplish that should be a focus area. These services may include subsidized childcare, transportation stipends, free or reduced programming, and meal vouchers.
- ▶ The value proposition of training programs among historically marginalized communities is centered around **attainability, accessibility, funding, and placement**. Enlisting direct-hire support from training programs is considered a leading practice and requires employer buy-in and engagement.
- ▶ The need for wraparound services doesn't end at the completion of a skills training program or gainful employment. Rather, employers' job placement practices may shift to meet job candidates where they may be in their career readiness. Years of additional support may be needed after the employee starts their job, as the barriers to career mobility are often generational.
- ▶ The "benefits cliff," or the offset in subsidized income associated with a small wage increase, creates a perverse disincentive for potential job seekers. **Utilizing tools like a benefits cliff calculator can help employers make better-informed decisions** when setting entry and mid-level wages.



Dashboard for Alabamians to Visualize Income Determinations (DAVID)

The Office of Alabama Governor Kay Ivey, in partnership with the Federal Reserve Bank of Atlanta, launched a first-in-nation career tool that includes a benefits cliff calculator within the state workforce development career path planner. DAVID helps individuals understand which career pathways will help them achieve self-sufficiency and overcome the potential loss of public assistance based on their income, region, occupation and family dynamics.

Assessment of wraparound services in the Southern Tier

The need for supporting historically marginalized communities with integrated training and support services was highlighted in many conversations with stakeholders across the region.

Our main takeaways from those conversations were:

- ▶ A comprehensive suite of wraparound services doesn't appear to be offered within the Southern Tier, which may present a barrier for potential job seekers and social service intermediaries. Ongoing inventory and coordination across wraparound service providers and potential funding sources may result in higher utilization of available resources, and thereby, entry-level training programs.
- ▶ Individualized services could be enhanced to support the unemployed, underemployed, and underrepresented talent in the region. Diverse communities may be especially marginalized, as cultural barriers between employers and the population often exist that may prevent engagement from displaced workers and underserved populations. Reinvesting in Community Navigators and continued support of community-based organizations may provide personalized – and less institutional – connections between potential job seekers, available wraparound services, and training opportunities.
- ▶ Physical training spaces exist across the region, but accessibility continues to be an issue. The region's car dependency and long commute times, especially in Southern Tier's more rural counties, present a challenge for those without access to a vehicle or public transportation. Representing a significant portion of the intended audience for these services, disenfranchised populations may require additional assistance and tailored solutions to overcome mobility barriers to upskilling opportunities.
- ▶ Populations in need of training may struggle with access to common support services including transportation and childcare. However, when these barriers are addressed, stakeholders report that there is often a lack of soft skills, workplace essentials, financial literacy, and basic technology skills to successfully employ this talent. Career readiness skills such as these can be developed in partnership between social services organizations and industry employers. Examples of adult training include: Successfully Completing Job Applications, Resume Workshops, Interview Practicums, etc.
- ▶ Designated training centers/partners may require support to sustain interest and participation from marginalized job seekers. Industry can supplement these activities and maintain engagement levels by offering ongoing career coaching and mentorship services.

- ▶ There are a number of programs in the Southern Tier that target disadvantaged and historically marginalized populations to include women in lower-income, majority-minority communities, veterans, at-risk youth, persons with disabilities, those in recovery from substance abuse, and justice-involved individuals. Those programs are supported by numerous programs by community-based organizations. Below are examples of a few:
 - Broome County Reentry Task Force (BCRTF) serves as a bridge between Broome County Mental Health Department, NYS Division of Criminal Justice Services, and local service providers. By providing a continuum of care for the previously incarcerated, BCRTF addresses barriers to successful reentry faced by formally incarcerated individuals returning to the Broome County community and workforce.
 - The Collaborative Recovery Empowerment of the Southern Tier (CREST) supports employers and job seekers with programs and training that encourage wellness, addiction, and recovery as it intersects with the workplace.
 - The Grow Binghamton Youth Program provides programming for young residents (14 to 21 years old) centered on building job and life skills while promoting life skills and career readiness.

While these programs offer valuable training and support, some stop short of industry-specific training and placement.

- ▶ The wraparound support services that most often inhibit traditionally marginalized and vulnerable populations from workforce and/or training entry in the Southern Tier region include:
 - Childcare: Limited availability for children (especially infants), high cost for parents, and low wages for caretakers make it difficult for some residents with children to enter the labor force.
 - Transportation: Compared with New York State, the Southern Tier is a vehicle-reliant region where 76% of commuters rely on personal vehicles to get to work. However, transportation options are limited, especially amid the rural parts of the region.
 - Training funds and income supports: The actual cost and opportunity costs of seeking training and advancement were noted by potential job seekers as a barrier to advancement.
 - Employment coaching/mentoring: Potential job seekers that have been out of the workforce sometimes require coaching to prepare for a job and mentoring once employed.

Potential opportunities

The following are opportunities that the Southern Tier could explore for integrated support of historically marginalized and vulnerable populations.

▶ Inventory and map wraparound services available throughout the region.

An aggregation and regional mapping of wraparound services may better direct potential job seekers, especially in historically marginalized communities, to the available resources in their area. Such a tool may also identify duplication, gaps, and opportunities for partnership between stakeholders in the workforce ecosystem. The inclusion of supports and career pathways by specific need would also be useful.

Potential partners: NYS DOL and other government-affiliated workforce agencies, social services, non-profits and community-based organizations

► **Reinvest and expand Community Navigator program.**

The expansion of Community Navigator programs akin to Chemung County's with added levels of employee engagement could support more potential jobseekers entering the workforce. With a team of employers and community navigators helping to drive connections to wraparound services and career pathway opportunities, potential job seekers may receive more direction and assistance as they engage an ambiguous social support, training, and employment ecosystem.

Potential partners: NY DOL and government-affiliated workforce agencies, social services, non-profits and community-based organization, industry associations, employers, BOCES and other training centers

► **Identify solutions to greatest barriers and integrate into training programs.**

Integrating wraparound services with short-term skills training could increase participation and successful completion of programs. In some instances, the EAC is already supporting these types of services, but they could be expanded. These services could be covered by additional grant/program funding or employer contributions.

Potential partners: NYS DOL and other government-affiliated workforce agencies, industry partners and associations, chambers of commerce, community-based organizations, social services, community leadership

► **Engage employers in remedial training and support programs for targeted populations.**

The knowledge, skills, and support received in these programs translate to better outcomes and a stepping-stone to short-term industry-specific trainings that could result in direct-hire opportunities in the future. Connecting these remedial trainings or program participants to formal industry trainings should be a priority and would benefit strongly from employer engagement. This could include presentations by Advanced Manufacturing industry ambassadors with similar lived experiences, company tours, and workplace simulations that lead to future interest in the industry.

Potential partners: Support organizations and training partners, industry partners and associations, and employers

► **Expand accessibility of short-term, employer-engaged training relevant to the Advanced Manufacturing industry.**

Short-term follow-on trainings connected to existing programs for marginalized and vulnerable populations could lead to better job opportunities in the Advanced Manufacturing industry. These manufacturing readiness trainings, often referred to as "bootcamps," include a combination of industry specific and workplace-readiness skills. Employer sponsors could help support these trainings with wraparound funds, ambassador/coaching time and with assured placement or interview opportunities.

The Opportunity Impact Training Program, a partnership between SUNY Broome, Broome-Tioga Workforce, NTS Department of Labor, and industry leaders, is a strong example of this type of training. The employer-driven curriculum taught during the three-week program equips a workforce with the skills needed to participate in the tradeable sectors. The proposed Specialized Technician Training Opportunities Program is another potential option.

Potential partners: NY DOL and other government affiliated workforce agencies, industry partners and associations, employers, education, and training partners



PluggedInVA

The PluggedInVA and Integrated Education and Training (IET) blueprint are models for career pathways that integrate academic and literacy skills, workforce preparation activities and occupation training through simultaneous co-enrollment in adult education and post-education and training.



Select examples of successful wraparound service initiatives

Coordinated services	<p>SURGE Center, Goodwill Industries of Greater Detroit</p> <p>Designed to support employees with managing personal challenges that may impede job retention, the SURGE Center formally partners with employers through a memorandum of understanding that align with the organization's workforce goals and needs. Employees receive assistance with sourcing several resources, including reliable transportation, affordable childcare, substance abuse treatment.</p>
Childcare	<p>Project Growth Business-Childcare Partnership Tool Kit, Wisconsin</p> <p>Wisconsin's Project Growth grant program collateral included the Business-Childcare Partnership Tool Kit. It provides employers with strategies and resources for building childcare capacity, building partnerships, assessing financing strategies, ensuring sustainability. The toolkit can also serve childcare providers, as it defines their role in the workforce development ecosystem.</p>
Transportation	<p>Corporate ESG/Social commitments, Austin, TX</p> <p>As part of a local employer's ESG initiatives, \$1.5 million has been earmarked for a national rideshare-sponsored program that provides reliable potential employees reliable transportation to get job training, interviews, or wraparound services. Leaders in Austin, TX have been successful in channeling a portion of that corporate investment into helping local job seekers overcome barriers to employment, including transportation.</p>
Coaching	<p>Career Coach Pilot Program, Arkansas Tech Institute (ATI)</p> <p>ATI, an entity of Arkansas Tech University, is executing on its regional workforce development strategy connecting students with local industry and career opportunities. Over the course of the 2022-23 school year, six career coaches will help high school seniors navigate career pathways. The career coaches are made possible partnerships between the Arkansas Department of Education, a local educational cooperative, local school districts, and the local chamber of commerce.</p>
Income stipends	<p>Renewable Energy and Efficiency Workforce (RENEW) Training Program, City of Charlotte</p> <p>The City of Charlotte, with the support of the Urban League of Central Carolinas, sponsors a 13-week training in the area of HVAC and electrical trades. In addition to career coaching for a paid work-based opportunity, participants earn an educational stipend of \$15/hour during the training period.</p>

Goal 4: Establish pathways to direct employment and growth opportunities.

Work-based learning is a proven solution for increasing the skilled workforce in Advanced Manufacturing. Traditional opportunities include internships, cooperative work experiences, and apprenticeships. Newer approaches such as hackathons, competitions, and special projects have emerged in recent years and are often used as career awareness tools.

In our conversations with Advanced Manufacturing employers in the Southern Tier, they recognized the importance of work-based learning opportunities but expressed hesitancy in utilizing them because of perception issues, the complexity and level of paperwork involved, and the dedication of staff to support them.

Training does not end once employment begins; reskilling plays an important role in employee advancement and industry competitiveness, especially in sectors undergoing significant transformation, like Industry 4.0 in Advanced Manufacturing. While robotic automation is not yet on the radar of many employers in the Southern Tier, nearly a third are planning to incorporate more digital automation in the next two years, based on results from the Workforce Development Job Seeker and Business Survey completed by the New York Department of Labor.

Increasing the buy-in, support and promotion of work-based learning and reskilling opportunities could support more placement of Southern Tier residents into higher-paying career opportunities within the Advanced Manufacturing industry and a more competitive industry as a whole.

Here are some considerations when implementing work-based learning and reskilling opportunities:

- ▶ Investing in employees' career development and supporting a culture of continuous learning are some of the most effective ways to retain talent, according to leaders of the Society for Human Resource Management. in 2022.¹
- ▶ Employer engagement is essential to development and support of work-based learning and reskilling programs. Employers inform the types of training needed, provide equipment for training purposes, and dedicate employee time to execute and participate in trainings.
- ▶ Given the upfront investment by employers, substantial support for implementation is critical, as well as education on the long-term benefits of work-based learning and upskilling opportunities.
- ▶ Awareness of these opportunities to potential and existing employees is a critical piece of the puzzle. Like employers, participants need to understand the opportunities available and the long-term benefits of participation. These opportunities can be promoted on a central career platform, at career events, through targeted outreach programs, or at internal employer events.
- ▶ Accessibility is key. Many Advanced Manufacturing work-based learning or upskilling opportunities require on-site and classroom training, but schedule conflicts and transportation could limit participation. Time away from the job due to travel might also be a consideration, especially in rural areas. More accessible training could resemble funding for an on-site training facility, options for virtual instruction, access to self-guided online training, or after-hours training. Many, if not all, of these would require investments in equipment, curriculum, and instructors.
- ▶ There is an opportunity cost for employees engaging in sponsored and non-sponsored trainings. Scholarships or stipends could reduce those costs and provide incentive for participation.

¹ Source: #SHRM22: Increase Retention in The Workplace: 14 Effective Strategies | #CauseTheEffect Brett Farmiloe, April 13 2022, The SHRM Blog

Assessment of work-based learning and reskilling opportunities in the Southern Tier

The utilization of work-based learning and reskilling opportunities was one aspect of the workforce ecosystem explored during our research on the region and in conversations with regional stakeholders.

Our main takeaways from that research were:

- ▶ Despite interest and investment to strengthen Southern Tier's Advanced Manufacturing workforce ecosystem, regional talent production is not meeting the needs of Southern Tier's employers. Of the limited participants exiting manufacturing training programs, few contain the skills required by employers, and employers may be less inclined to engage in the current system if they don't view it as a viable source of talent.
- ▶ Stakeholders reported that enrollment in Advanced Manufacturing training programs is low. Rapid skilling programs, boot camps, accelerated micro-credential programs, and paid work-based learning opportunities are limited. In addition to increasing awareness of the industry, training facilities and programs could adapt to meet the needs of potential job seekers.
- ▶ Manufacturers in the Southern Tier region expressed limited interest in apprenticeships and other work-based learning due to perception issues, the complexity and level of paperwork involved, and the dedication of staff to support them. Employers also believe the benefit of grooming talent through an apprenticeship is outweighed by the risk of losing that employee to a competitor once trained.
- ▶ Awareness of workforce development opportunities is a challenge for both employers and job seekers. A singular platform that aggregates training and upskilling programs within the Advanced Manufacturing industry sector, coupled with an outreach program that enumerates the benefits of training programs for employers and job seekers, could alleviate this issue. Conversely, there is an opportunity cost associated with work-based learning for employers and employees, despite the potential long-term return on investment. Short-term incentives and supports for both parties could alleviate some of these costs.

Potential opportunities

The following are opportunities that the Southern Tier could explore in work-based learning and upskilling opportunities.

▶ **Employ workforce coordinators to enhance regional employer outreach, education and support.**

As Goal 1 notes, employers need accessible, real-time information on available training programs and resources and a concierge for navigating them. These workforce coordinators, many of which exist to some capacity in select IDAs, could also conduct outreach and provide education and support for employers in the implementation of trainings. They could work with individual employers to develop company-specific training or with a number of manufacturers to develop shared programs. Trainings on the value of employee development and continuous learning and a cost-benefit analysis tool could also be beneficial in illustrating the long-term return on investment of training.

Potential partners: NY DOL and other government-affiliated workforce agencies, industry associations, education and training centers, and local IDAs or EDOs

► **Develop tools and specific outreach programs to promote apprenticeships and other forms of work-based learning.**

Employers need more support and a better understanding of the value of apprenticeships and other forms of work-based learning. As the number of these opportunities expand, inclusion on a broader sector opportunity platform is imperative to raise awareness. A campaign or targeted outreach program, like “apprenticeship signing days” may also be necessary to shift perception.

Apprenticeship programs could support in-demand occupations like general machinist, industrial production technicians, industrial machinery maintenance workers and welders.

The development of a program that aggregates apprenticeship opportunities could leverage leading practices that surface from the following initiatives:

- Advanced Manufacturing Partnership in Chemung County
- The American Apprenticeship Initiative
- Women in Apprenticeship and Nontraditional Occupations
- NY College Apprenticeship Network

Apprenticeships evolved

Organizations like the Federation for Advanced Manufacturing (FAME) have developed proprietary methods, strategies, and sponsorship models that enable employers to more easily develop apprenticeships in a manner that is both compliant with United States Department of Labor (USDOL) requirements and presents the best value to the employer. In recent years, new modalities, learning systems, wage scales, and sponsorship guidelines have been enacted that make apprenticeships far easier to use.

Potential partners: NY DOL and other government-affiliated workforce agencies, major industry associations and employers

► **Explore opportunities to implement cooperative (co-op) education programs in manufacturing disciplines.**

Co-op programming is characterized by close collaboration between institutions of higher education or training organizations, and employers. Traditionally, co-ops combine classroom instruction in varying modalities with hands-on learning as a part-time or full-time employee with an employer. It is common for co-op students to receive academic credit for demonstrated competencies during employment. Most co-ops provide financial support or sponsorship of students, sometimes in the form of stipends, allowances for tuition and books, or traditional wage scales paid by the employer. In many cases, internships have replaced co-ops, but a recent resurgence among employers seeking talent solutions has shown promise for this model.

Potential partners: NY DOL and other government-affiliated workforce agencies, major industry associations and employers, related technical instruction providers, higher education partners

► **Collaborate on programming for reskilling needs.**

Specific programming can be informed by workforce coordinator feedback, through a consortium of manufacturers, or on an employer-by-employer basis. Programming could include leadership training, digital transformation, and other elements of Industry 4.0. These programs could be hosted in-house, virtually, at training centers across the Southern Tier, or take a hybrid approach. When possible, coordination agreements among education and training partners can help improve accessibility across the region. Promotion of these reskilling opportunities could be on a central career platform, at career events, through targeted outreach programs, or at internal employer events.

Employers could demonstrate their dedication to a culture of continuous learning by providing incentives for successful completions by way of compensation increases, time off for classes, a stipend to offset costs associated with programming, and company-wide recognition.

Potential partners: NY DOL and other government-affiliated workforce agencies, major industry associations and employers, related technical instruction providers, local higher education partners



Advanced Manufacturing Strategy Implementation

Key stakeholders in the workforce ecosystem were convened to contribute to the Southern Tier REDC's annual report and to support the scope of this project. Many of those stakeholders will also play an essential role in the scaling of existing programs or the development of new programs that can make a positive impact on targeted workforce development efforts in the region. Collaboration and coordination across the workforce ecosystem will be integral to the successful launch of potential opportunities outlined in this strategy report.

A key consideration in strategy implementation will be the timelines, eligibility, and organization of tasks necessary to successfully apply for current and future programs administered by the Office of Strategic Workforce Development.

Ideally, the Southern Tier REDC is best to serve as a champion and convener of this strategy. In doing so, it would support the regional efforts of the existing workforce ecosystem by convening partners to identify and execute initiatives aligned with the regional economic and workforce priorities. The REDC would also provide ongoing guidance regarding current and future grant programs. The following considerations and steps have been developed to assess the feasibility of current and future initiatives in an organized and quantifiable manner.

Project identification and considerations

In exploring future projects or initiatives, the Southern Tier REDC, regional stakeholders, grant applicants, and others could consider:

- ▶ Does the initiative have the potential of making measurable and positive impact on the development of a workforce pipeline in the target sectors? How?
- ▶ Does the initiative clearly demonstrate value in reaching underserved populations, displaced workers, ALICE workers, the underemployed, and similar demographics?
- ▶ Will the program include business and industry support in the form of direct placement, on-the-job training, industry credentials, or assistance in the development of training capacity?
- ▶ What steps are being taken to prevent duplication of efforts in the region? What individuals, entities, or organizations can assist in determining whether an existing project should be augmented or a new project considered?

Potential implementation steps

To the extent possible, it is suggested that project ideas and potential areas of collaboration be shared with the Southern Tier REDC to determine the best potential partners, identify existing and similar programs, and share guidance on the grant program and timelines. The Southern Tier REDC is likely in the best position to inform potential applicants of regional, economic, and industry developments that could benefit the grant application process or achieve economies of scale in certain efforts. In some cases, project ideas may not include utilization of current OSWD grant programs.

Step 1: Convene

The Southern Tier REDC has established convening ability in the region through their existing workgroups, and others have interregional capabilities that could be tapped as well.

- ▶ Project considerations could start with identifying the stakeholders, organizations, and/or individuals who could be included in preliminary discussions. The Southern Tier REDC and key subregional workforce agencies can serve as advisors for this process.

For example, the establishment of an employer-sponsored, short-term training program that focuses on the rapid upskilling of recent high school graduates would likely include the following entities in the Southern Tier region: employer, local community college or university, BOCES and local school district. Additional stakeholders such as wraparound service providers, curriculum or certification bodies, or others could be included as the design of the project progresses.

- ▶ Once potential partners are identified, outreach could be conducted to convene all potential project participants.

Step 2: Organize

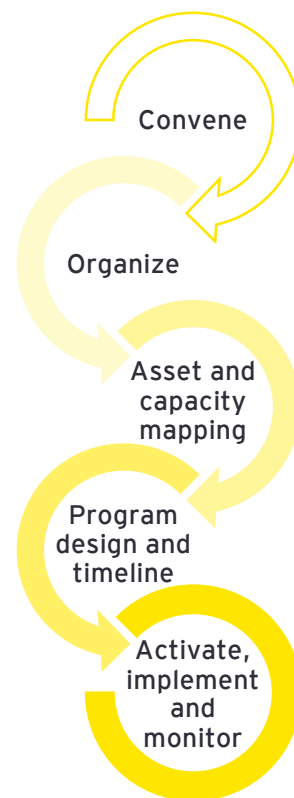
- ▶ Meet to discuss the project idea, scope, and preliminary goals.
- ▶ Establish the projects relevance to the identified tradeable sectors, based on ESD's guidelines and priorities.
- ▶ Establish a project lead, likely based on the focus of the project.
- ▶ For example, development of a new wraparound service could be led by an existing social service organization. The development of a new apprentice program could be led by a potential sponsor or employer.
- ▶ Organize all meetings to ensure communication, documentation, agenda items, and action items are well-documented and shared.

Step 3: Inventory assets and capacities

- ▶ Explore similar programs, leading practices, and determine required assets and capacities to successfully launch the project or initiative.

If utilizing OSWD grant programming, follow the application, documentation, and timeline guidance provided in the grant documentation.

- ▶ Assess capacity of stakeholders, ensuring all required elements of the program are in place. As part of the assessment, consider what entities have the ability to contribute financial, in-kind, space, or other resource support that is essential for the project.
- ▶ Identify gaps in funding, capacity, expertise, and other assets necessary to launch the program.
- ▶ Conduct outreach to identify additional capacity and/or assets, utilizing the Southern Tier REDC and other regional stakeholders as assets.



Step 4: Program design and timeline

- ▶ If multiple project ideas exist, the Southern Tier REDC can support prioritization based on the significance of need, workforce priorities, and established leading practices in the region.
- ▶ Program design could account for the comprehensive life cycle of the design, launch, administration, and monitoring of the program. Grant funding will require specific plans on each component.
- ▶ Metrics of success should be determined at the beginning of a program and be human-centered and impact-focused. During the monitor portion of a program, metrics could be assessed if they adequately capture intended impact and iterated upon if better metrics are identified. These metrics will vary from program to program, depending on grant requirements and the stakeholders involved.
- ▶ Concurrent to design, all efforts could be made to establish momentum, awareness, and inclusion of underserved populations and the integration of wraparound service providers. Both digital and grassroots efforts could be considered and deployed.
- ▶ Specific timelines and goals should be created that account for program goals, partner capacities, and regional workforce priorities.

Step 5: Activate, implement, and monitor

- ▶ Consider a launch event that can draw attention and result in immediate momentum for the project. Enlist support from industry, non-profit, educational, and government leaders.
- ▶ Monitor progress and efficacy of the program through established guidelines in operating agreements, focusing on administration and tracking of metrics and goals.
- ▶ Seek opportunities to scale the program through additional partners, assets, or marketing.

Agribusiness

A workforce development
strategy for Agribusiness
industry in the Southern Tier





Agribusiness Research findings

Industry overview

The ST REDC selected Agribusiness as one of the two industries to receive a workforce strategy based on its potential for unemployed, underemployed, and underserved jobseekers, as well as its ability to promote resiliency in the regional economy.

The Southern Tier is committed to transforming its Agribusiness industry into a world-leader in agriculture technology and a key food supplier for the East Coast. The industry employs nearly 6,000 people, and that amount has grown by almost 20% over the last 10 years. As technology and innovation continue to transform the \$5 million regional industry, the sector is positioned to deliver higher yields while also becoming a leader in sustainable and resilient food production.

Workforce challenges are plaguing the Agribusiness industry sector, especially in the Southern Tier. Farmers are aging and the next generation is not as interested in carrying on the family business. There is also a decrease in migrant labor. Compounding these challenges are lower labor force participation rates across the region, especially for minorities. The region also has a higher percentage of persons with a disability. These matters, when combined with the technological transformation of the industry, present both challenges and opportunities. Addressing these will be integral to the Southern Tier achieving its goals in the Agribusiness industry and will require a diverse array of outreach, training and support services for both the workforce and industry.

Agribusiness presents a growing opportunity for potential jobseekers, including those that are currently disengaged from the workforce or underemployed, like the nearly 30% of households that are Asset-Limited, Income-Constrained and Employed (ALICE).¹ Careers in Southern Tier's Agribusiness industry have low barriers to entry and budding growth opportunities, thanks to support from a premier research institution and its agricultural extension program. For all these reasons and more, Agribusiness continues to be a key tradeable sector for the Southern Tier.

¹ Source: UnitedWayALICE.org Research Center, New York-Household Budgets 2018, United Way of Northern New Jersey Corporation

Workforce analysis

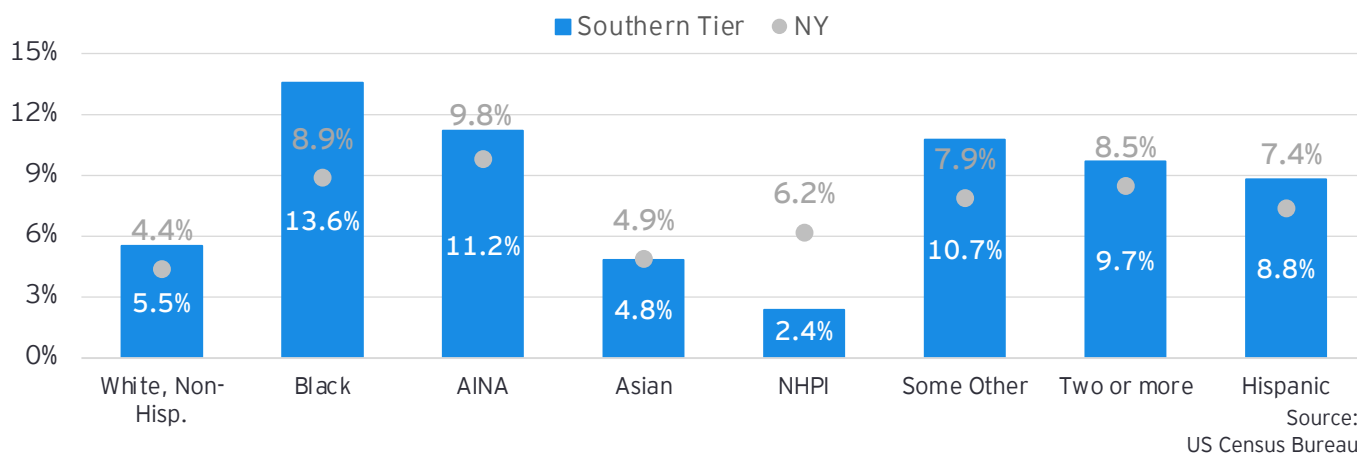
Population trends by year, age, and race/ethnicity, in particular, provide actionable insights on the region's ability to supply the labor needed to support the Southern Tier's economy.

Unemployment and labor force participation

- ▶ Unemployment rates have steadily declined since the height of the pandemic, and now hover around 3.7%, which is slightly less than the state average.
- ▶ Labor force participation is much lower in the Southern Tier than the state average. Less than 60% of residents of working age (16+) are in the labor force (either working or looking for work).
- ▶ Minorities in the Southern Tier have lower workforce participation rates and higher unemployment rates, with a few exceptions.
- ▶ Educational attainment seems to play a factor in employment as well, as unemployment rates decrease and labor force participation rates increase with each increase in level of education.

The region has an opportunity to increase minority participation in the workforce

Unemployment rate by race/ethnicity, 2020



Population trends

- ▶ Of the eight counties in the Southern Tier region, Tompkins County was the only one with a population increase over the past 10 years (3.3%). Broome County experienced the smallest decline (-1.1%) while Chenango saw the largest (-7.3%)
- ▶ The Southern Tier region has an aging workforce: the retirement age population (65 years old or older) has those 25 to 44 years (5%) and 15 to 24 years (2.6%). The 45- to 64-year-old age group declined significantly (-8.6%).
- ▶ The population of Southern Tier is predominantly white. Minority populations are three to four times proportionally smaller in Southern Tier versus state averages. Still, the population of Southern Tier is becoming more diverse, with high growth in Hispanic, other, and Black populations. The white (non-Hispanic) population is declining.
- ▶ The Southern Tier has a much higher share of teenage and college-age populations (15 to 24 years old) than the statewide average (17% vs. 12%, respectively), but a much lower share of young professionals (25 to 44 years old) by nearly 4 percentage points.

Industry analysis

Examining the overall trends facing the Agribusiness industry sheds light on the region's competitiveness to recruit, expand, and retain high-impact businesses that invest in the tax base. Equally important, these enterprises present an opportunity to offer high-quality, in-demand jobs for Southern Tier's unemployed, underserved, and underrepresented populations.

- ▶ There are nearly 6,000 workers in the Southern Tier's Agribusiness industry, and it is growing. Agribusiness jobs grew 21% between 2012 and 2022. During that same time period, the number of Agribusiness establishments grew 47%.
- ▶ The largest subsectors (by total jobs) in Agribusiness are Milk Manufacturing (1,307 jobs) and Animal Production (1,003). The subsectors adding the most jobs over the last five years were Animal Production (143 jobs), Crop Production (135), Breweries (129), and Dog and Cat Food Manufacturing (119).
- ▶ The fastest-growing Agribusiness subsectors in the Southern Tier are Beverage Manufacturing and Crop Production. The region's largest subsector, Food Manufacturing, grew only slightly in the last five years. Animal Production has a high per capita concentration relative to the US.
- ▶ The talent pipeline in the Agribusiness industry appears relatively balanced across the age spectrum, with 58% of the Agribusiness workforce being 44 or younger. However, according to a survey conducted by Cornell CALS and Grow-NY, the average age of farmers in the New York is 51.
- ▶ Southern Tier's gender split within Agribusiness mirrors the overall workforce, with just a slightly higher share of male employment.

Occupational analysis

Talent development requires coordination amongst employers, educators, and training facilities. Maintaining a system-wide understanding of staffing patterns, typical entry level education, and potential earnings helps to preserve a talent pipeline that's responsive to the needs of employers and job seekers.

- ▶ Earnings in Agribusiness are slightly below the total industry average in the Southern Tier (\$68,164 vs. \$74,000 for all industries), but few jobs require more than a high school diploma.
- ▶ Occupations in Agribusiness are most abundant for workers with education attainment levels of a high school diploma or less, but this could shift as the regional industry becomes more advanced.
- ▶ For positions requiring a high school diploma or equivalent, most jobs in Agribusiness are for machine operators, laborers, and other support positions.
- ▶ For certificate or associate-level positions, opportunities are comparatively limited with jobs for drivers, technicians, and clerks being most abundant.
- ▶ For positions requiring a bachelor's or advanced degree, positions are more limited comparatively. Most jobs are for managers, accountants, and scientists.

Educational programming observations

A region's ability to produce talent across the entire labor spectrum is closely linked to its ability to sustain economic growth. Analyzing the output from the Southern Tier region's educational programming provides insights on labor shortages, misalignment with employer needs, and clarity into workforce development investments.

General

- ▶ The population in Southern Tier is educated evenly across postsecondary levels, with 12-17% of adults having some college, an associate, bachelor's or a graduate degree. Over 40% of adults have a high school diploma or less, and educational attainment is improving.
- ▶ Most college graduates in the Southern Tier get degrees in Business or Engineering at the bachelor's level or above. Health graduates are the third-highest output and include graduates with associate's and some certificates. Other large programs include Computer/IT, Biological Sciences, and Social Sciences.
- ▶ Graduate increases are highest in the Southern Tier in Health and IT programs. Bachelor's in IT increased by over 300 graduates over the last five years. Master's in Business grew by 220 graduates and Bachelor's in Biology grew by 151. Some declines at the associate's level (Business and Liberal Arts) may reflect a change in institutional offerings.
- ▶ Accredited certificate production is highest for one-year programs (93.8%), and few short-term programs are available.
- ▶ New registered apprentices have more than doubled in the Southern Tier since 2016 and are currently at their highest levels, but these new apprenticeships are concentrated in the skilled trades: Electrician programs are the top apprenticeship program within the region followed by painters, construction and maintenance. Electrical programs experienced the most significant growth followed by glaziers.

Industry-specific educational programming

- ▶ Agribusinesses require fewer workers with postsecondary education than most industries. Still, technicians and maintenance workers are needed along with select engineering and scientist positions. Our gap analysis shows that the Southern Tier underproduces (accredited) certificate-level education and produces a wealth of graduates in agriculture management and agriculture, environmental, and veterinary sciences.
- ▶ Certificate-level positions do not appear to be served by local programs (at accredited institutions, not including non-profits), which may suggest Agribusinesses are reliant on for-profit educators, on-the-job training, or recruiting from outside the region. Certificate programs for Agribusiness that could benefit the region include **Industrial Machinery Maintenance** and **Small Engine Mechanics**.
- ▶ Bachelor's-level positions are well-served by local programs. **Agriculture Managers, Agricultural Scientists, and Environmental Scientists** graduate from local institutions at levels far higher than local job openings require, offering a potential value proposition to any relocating/expanding company in the region.
- ▶ Also, while few job openings are created for **Veterinarians** at the PhD level, the region produces a large number of graduates. **Vet Technologists** also are overproduced relative to local need.

Supply-Demand Gap Conditions Agribusiness, Southern Tier

Gap	Occupation Group	Avg. Educ. Level	Regional 2021 Job Openings	Regional Graduates	Regional Ratio	Supply-demand Ratio versus US
Lg Shortage	Industrial Machinery Maintenance	Certificate	92	0	0%	0%
	Small Engine Mechanics	Certificate	19	0	0%	0%
	Forest and Conservation Technicians	Associate's	16	0	0%	0%
Over-Supply	Environmental Science Technicians	Associate's	4	14	350%	872%
	Veterinary Technologists and Technicians	Associate's	32	67	210%	431%
	Farm and Greenhouse Managers	Bachelor's	64	332	516%	1107%
	Agricultural & Food Scientists	Bachelor's	22	188	844%	756%
	Environmental Scientists & Engineers	Bachelor's	24	321	1348%	528%
	Veterinarians	PhD	4	107	2675%	4111%

Lg Shortage
Shortage
In-Balance
Over-Supply
Lg Over-Supply

Source:
EY analysis of data from Lightcast and US Dept. of Education

Ecosystem observations

An initial framework was developed to help assess the strengths, challenges, and opportunities across the Southern Tier's regional workforce development ecosystem. This framework focused on the areas of 1) industry-informed training, 2) awareness of opportunities, and 3) wraparound services and support. The following illustration outlines the types of work within each of those focus areas.



It is important to note that the Southern Tier region is broad and diverse with multiple population and employment centers spanning the eight-county region. Some of these subregions are better organized and resourced in their support of workforce and the target industries.

Industry-informed training

Strengthening relationships between employers and the talent pipeline is a central component of OSD's approach to workforce development. Alignment of industry needs with career readiness, on-the-job training, and upskilling and reskilling activities may expand career pathways for all segments of the labor force.

- ▶ The Agribusiness industry is facing significant transformation as innovation and technology platforms are changing how things grow, where they grow, and the tools and platforms used to grow things more efficiently. The slow adoption of these technologies by farmers and food manufacturers flips the typical industry-informed model and places local universities and extension services as the drivers of transformation.
- ▶ Cornell's College of Agriculture and Life Sciences and Cornell AgriTech are driving the innovation in the industry worldwide and can support the region's adoption through the university's research, education, and extension programs.
- ▶ Other training institutions support the Agribusiness industry through maintenance and various technician trainings.

Awareness of opportunities

Innovation within the Agribusiness industry has advanced the means of production and processing, and has resulted in a number of emerging career opportunities. Clear definition of these new career opportunities, stakeholder roles, the target audience, and methods of promotion may increase broader awareness and participation within the target sectors.

- ▶ Limited awareness and negative perceptions of jobs in the Agribusiness industry may require proactive marketing and promotion of career opportunities. An established vision and regional plan for the future of Agribusiness could also increase interest.
- ▶ There are a number of National Future Farmers of America chapters established in schools across the region that promote and support agricultural education and opportunities in middle and high school.
- ▶ At least one subregion has developed a coordinated program for building awareness and engaging students in career opportunities, especially in STEM-based occupations. There is an opportunity to establish and launch more campaigns and activate a more comprehensive, sustained effort.
- ▶ The region's chambers, economic development organizations and the industrial development agencies (IDA) provide another layer of connectivity between employers, educators, government partners, and non-profits, but the resources and level of engagement vary across the region.
- ▶ The regional workforce boards are providing assistance to select sectors and for target populations, but alignment and awareness of services could be improved, according to stakeholder input.

Wraparound services and support

Socioeconomic barriers may hamper target populations' ability to obtain a job in a regional tradeable sector, complete a career-advancement program, or participate in the labor force. Addressing these impediments through services and programs may unlock opportunities for hidden talent and the Agribusiness industry cluster.

- ▶ Limited available childcare spots for children (especially infants), high cost for parents, and low wages for caretakers make it difficult for some residents with children to enter the labor force.
- ▶ Compared with New York State, the Southern Tier region is a vehicle-reliant region where 76% of commuters rely on personal vehicles to get to work. Public transportation appears limited across the region.
- ▶ Support with visa programs was noted as one area of significant need, especially in regional farming operations.
- ▶ Comprehensive wraparound support services appear limited that could support untapped talent from the workforce and/or training entry, and both job seekers and employers may struggle to navigate the resources that are available. Additionally, potential job seekers that have been out of the workforce sometimes require coaching to prepare for a job and mentoring once employed. Past Community Navigator programs have sought to bridge this gap but do not have sustainable funding or enough capacity to support the need.

Agribusiness Strategy framework



Industry overview

With the insights gathered through the background review and stakeholder engagement process, the following strategic framework was developed as the foundation of a sector-based workforce development plan.

The strategic framework comprises four goals, each with considerations that clarify the direction Agribusiness leaders could pursue to achieve the goal. Within each goal, an assessment of activities identifies areas that are primed for change or investment. Opportunities are presented as potential solutions, which may be taken to address stated challenges and realize the goal.

Goals

1

Enhanced regional coordination and support for the future of Agribusiness.

2

Generate awareness for the future of Agribusiness.

3

Expand outreach and training to support the evolution of Agribusiness.

Target populations



Asset-Limited,
Income Constrained,
Employed (ALICE)



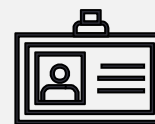
Individuals outside
of the workforce



Talent outside of college
bound students



Graduates from local
colleges and universities



Incumbent
workforce

Goal 1: Enhanced regional coordination and support for the future of Agribusiness.

Global and statewide Agribusiness trends point to considerable changes to the industry and ecosystem. Agricultural consolidation, an aging workforce, rising scarcity of resources and costs of labor, rapid innovation and an increased use of new farming methods are just a few developments within the industry that are reshaping workforce patterns.² The challenges and opportunities associated with these changes are evident in the Southern Tier. In recognition of these challenges and opportunities, support for the Agribusiness industry should be balanced on serving the needs of today and evolving to build the necessary pipelines of talent for the future.

Given the breadth and pace of the industry's transformation, stakeholders in the Southern Tier's Agribusiness sector should continue to align on defining and activating a vision for the future of Agribusiness in the Southern Tier and building a regional workforce pipeline in support of it.

Some considerations for regional coordination and industry support include:

- ▶ Building a future in the Agribusiness industry will necessitate a forward-thinking vision of food production, processing, and distribution. Consideration should be given to identifying the critical support areas for the industry, both in traditional Agriculture and in AgriTech, and bringing those key stakeholders into the fold.
- ▶ The talent and innovation solutions necessary for the Agribusiness evolution will require coordination and contributions from a host of partners involved in the entire workforce ecosystem – employers, educators, innovators, agriculture associations, community-based organizations/non-profits and government organizations, to name a few.
- ▶ Inventorying and assessing the programs, targets and funding sources of all partners in the current workforce ecosystem is a critical first step in identifying gaps and opportunities and in aligning efforts moving forward. A better understanding of the available resources and their limitations will also support more effective allocation of these funds.
- ▶ The geospatial and siloed nature of the Agribusiness industry sector relies heavily on various organizations and networks to convene employers/producers, educate them on relevant industry topics, activate shared initiatives, and advocate on their behalf. To be effective, these associations require codified communication channels to share observations and leading practices with partners inside and outside the region.
- ▶ To better understand the workforce resources available to support the Agribusiness transformation, employers will need an industry advocate that also provides real-time information on available training programs and resources, plus leading practices on talent management, leadership, and new industry dynamics.

² Source: Christine Metha, *A Call for Innovation: New York's Agrifood System*, Center for Regional Economic Development, April 2021

Assessment of regional coordination and industry support in the Southern Tier

Regional coordination and industry support were common discussion points shared in our stakeholder conversations. Some key observations include:

- ▶ The 2020 Southern Tier Upstate Revitalization Initiative Plan outlined a framework and strategies for transforming the food and agriculture industry in the Southern Tier to be a “world-class leader in agricultural technology and serve as a key food supplier for the East Coast of the US.” The plan outlined a key role for the Cornell College of Agriculture and Life Science (CALS) in leading the charge and the establishment of a Food and Agriculture Development Cooperative.
- ▶ Cornell CALS is a significant asset to the industry, and its Center of Excellence for Food and Agriculture (COE) and Center for Regional Economic Advancement (CREA) are advancing the industry through research and commercialization. However, there may be a disconnect between the breakthrough innovation generated at Cornell CALS and the adoption by regional producers/employers, job seekers, and training institutions.
- ▶ The Cornell Cooperative Extension (CCE) operates eight independent offices throughout the Southern Tier providing educational programming and industry and workforce support. Their local presence across the region enables them to connect with most producers.
- ▶ While Cornell CALS and CCE have a well-defined role in the ecosystem, the cast of supporting stakeholders may be underutilized – especially as the vision of Agribusiness expands and becomes more interdisciplinary. An inventory of programs and capacity across community colleges, the local BOCES, workforce development boards, and industry groups should be conducted. This information can inform the development of new and emerging career pathways across the growing Agribusiness supply chain.
- ▶ The absence of an actionable, region-specific inventory/directory of service providers may pose a barrier for those seeking resources. Currently, one of the best representations of a comprehensive inventory/directory of service providers is managed by Farmland for a New Generation New York, which simply lists the contact information for 38 partner organizations across the state.
- ▶ The Agribusiness industry is naturally siloed by commodity, by producers and processors and by the traditional agriculture and Agtech communities. An association or consortium of Agribusiness representatives could address the various needs across the sectors which may currently be limited in its ability to to elevate its shared needs among educators and to policymakers. It also creates barriers to awareness of available resources for engaging with potential job seekers, educators and workforce agencies.

Potential opportunities

The following are opportunities that the Southern Tier could explore to enhance regional coordination and support of Agribusiness:

► Establish a Future of Southern Tier Food and Agriculture Workgroup.

This workgroup, which take the place of (or work alongside) the Southern Tier Food and Agriculture Development Cooperative, could develop a formal plan for activating elements of the Southern Tier Upstate Revitalization Initiative Plan that called for transformation of the food and agriculture industry. The workgroup could be led by Cornell CALS, as stated in the report, but would also include representatives from regional producers, processors, packagers, manufacturers, distributors, innovation centers, research institutions, extension services, workforce development partners, and industry/commodity associations.

The workgroup could collaborate with national industry associations (e.g., Future Farmers of America) or statewide organizations (e.g., Farmland for a New Generation New York). It could also be a platform for sharing leading practices, activating shared initiatives, and enhancing overall collaboration. Such an organization could also take ownership of much of this strategy.

Sample initiatives they could tackle:

- Defining the future of Agribusiness and its implications on the regional industry
- Identification and awareness for engagement opportunities (e.g., industry ambassador programs, networks/initiatives for diverse populations, shared apprenticeships)
- Ongoing skill needs/assessment for the industry
- Dissemination of best practices to farmers and Agribusiness participants across the value chain

Potential partners: All partners listed above

► Develop a task force of workforce and education partners focused on the future.

The task force could be associated with the Future of Agribusiness Workgroup. It would identify and activate workforce-related resources based on the identified needs of the larger workgroup. This task force would allow for all entities engaged in building the workforce pipeline to convene for awareness and assessment of current challenges and future opportunities all sectors, but for the Agribusiness industry specifically.

This task force could take on the role of asset mapping, identifying roles for the workforce task force that fall outside the purview of Cornell CALS and CCE, and convening stakeholders to promote workforce development activities around the future needs of the Agribusiness industry. It could also help guide future use of the Southern Tier Agriculture Education Fund.

Potential partners: NYDOL and government-supported workforce agencies. Cornell CALS and CCE, other training centers and educational institutions, non-profits and social services organizations providing wraparound services and support for target populations



Heartland Robotics Cluster

The Invest Nebraska Corporation and the University of Nebraska-Lincoln led a winning Build Back Better Regional Challenge application to establish the Heartland Robotics Cluster. The initiative will support the future of Agribusiness using robotic technologies and advanced manufacturing automation. The initiative also includes plans for workforce outreach in rural areas to ensure they are not left behind as the industry advances and manufacturing demonstrations spaces to support adoption of new technologies.

► **Develop an inventory and assessment of existing workforce programs, programs for target populations, and funding sources.**

A high-priority task for the task force would be to develop a comprehensive inventory that could be used to create an asset map of resources for potential job seekers and employers but could also be the foundation for an assessment that maps funding sources, program targets, and programs in an effort to identify gaps and challenges and ways to utilize resources most effectively. This inventory could also map the components of training in Agribusiness so missing capacities could be more easily identified in the future.

Potential partners: Local workforce development agencies, Cornell CALS, CCE, other higher education and training providers, non-profits, and social service organizations



Goal 2: Generate awareness for the future of Agribusiness.

Limited awareness and misperceptions surrounding career opportunities was a resounding theme across the Southern Tier. This issue was expressed across industry sectors and by employers large and small, but it was especially true in Agribusiness. Its prominence across the regions, sectors, and employers suggests that it not only be a top priority for the Southern Tier but for the state, as a whole.

Stakeholders in the Agribusiness industry noted a decline in interest in Agribusiness as a career opportunity, even among long-standing farming families. While EY's research found the highest concentration of Agribusiness workers in the Southern Tier to be slightly younger (45.8% are 25 to 44), a survey conducted by Cornell CALS and Grow-NY found the average age of farmers in New York to be 51.³ Promoting awareness of the current and future career opportunities within the Agribusiness sector should be a priority, especially for the K-12 talent pipeline. And with the industry transformation in mind, awareness and outreach opportunities could extend further to those currently in more traditional agriculture businesses and those seeking to re-enter the workforce or considering a career change.

Here are some considerations when focused on the K-12 pipeline:

- ▶ Awareness and exposure can start at an early age with the level of employer engagement increasing over time as the students reach junior high school.
- ▶ The misperception of certain career opportunities by school administrators, teachers, and career counselors could impact students' awareness and access to valuable training and opportunities.
- ▶ Parents should not be overlooked in awareness efforts, as they often play an important role in guiding their child's future career and educational decisions.

For all audiences:

- ▶ Content should be exciting to interest students and potential job seekers in engaging in further exploration.
- ▶ Misperceptions will need to be addressed head on, both in aspects of the job and work environment and a person's ability to do the job, due to skills, resources, and networks.
- ▶ Peer experience is viewed as an effective method for helping both students and potential job seekers see themselves in an opportunity. These ambassador-type programs have been popular for the last several decades and with social media, have the potential for an even greater reach.
- ▶ Career opportunities can be a driver for talent attraction and retention efforts, but the promotion of the region/communities and its livability are also important. Many communities package this information in a live, work, and play framework.

³ Source: Christine Metha, A Call for Innovation: New York's Agrifood System, Center for Regional Economic Development, April 2021



Field Atlas | Career Exploration Platform + Ambassador Program

Indiana has a dedicated platform, Field Atlas, for engaging with career opportunities in the AgBioScience industry. The platform features career pathways, industry ambassadors and innovation-based lesson plans for teachers. The platform is part of a broader initiative to grow the AgBioScience industry in Indiana.

Assessment of career awareness in the Southern Tier

Awareness was one of the key aspects of the workforce ecosystem explored during our research on the region and in conversations with regional stakeholders.

- ▶ Reaching and engaging the target populations will likely necessitate a well-resourced multi-media campaign and interactive platform for promoting careers and educational opportunities in the Agribusiness industry, plus the future of Agribusiness that is being driven in the Southern Tier. Broader awareness for post-secondary degrees, certificates, and training for roles such as veterinary technicians, controlled environment agriculture (CEA) technicians, and computer network support specialists should be a strong consideration in any outreach plan. An initiative of this size could be led at the state level with ties to regional resources and opportunities.
- ▶ The career awareness initiatives and resources available by school district vary by community. A shared curriculum and coordinated plan, like the PEAK Program in Broome and Tioga counties, for career awareness and employer engagement could benefit those schools with less resources. In some instances, resources, equipment, and initiatives could be shared across numerous districts through the local BOCES or a regional educational foundation.
- ▶ Regional assets and events such as Steuben County Robotics Program, Agriculture Literacy Week, Agriculture in the Classroom, FFA and 4-H youth development programs provide awareness and exposure opportunities for students, teachers, and parents across the region. Enhancing these programs and tying them to a broader employer-engaged effort will be beneficial in the future.
- ▶ In addition to any statewide resources, there are initiatives sponsored by national agriculture associations for promoting careers in the sector. These often include networks, events and competitions, sample activities and curriculum suggestions, and toolkits for promoting sector opportunities. The region should leverage these publicly available resources when possible.

Potential opportunities

The following are opportunities that the Southern Tier region could explore to increase awareness and excitement for career opportunities in the Agribusiness industry.

▶ **Develop a statewide multimedia campaign in select targeted sectors.**

These campaigns could include testimonials from peers, videos showcasing companies, innovations and occupations and virtual reality experiences, to name a few. Content should be optimized for various media channels and sharing platforms.

Potential partners: : NY ESD, New York Department of Labor (DOL), major industry associations, employers

▶ **Launch an interactive website to showcase pathways, opportunities, and resources.**

Any multimedia campaign could direct students, parents, and potential jobseekers to a landing page to further explore statewide or regional information on sector opportunities. Content should be well-designed and engaging and target specific audiences. If sector-specific, the site could also provide information on the region's efforts in the future of Agribusiness and the resources available to engage in the transformation.

Potential partners: NYS ESD, NYS DOL and other government affiliated workforce agencies, REDC, major industry associations, employers, training and education partners



Western Growers Agtech Workforce Readiness Campaign

A consortium of local and regional family produce farmers in the western US formed a partnership in 1926. More recently, they launched an initiative to address the labor shortage in the industry. This workforce readiness campaign includes career exploration, curriculum support, pitch competitions, and networking events.

► **Develop a regional plan for employer engagement and career awareness for the K-12 pipeline.**

A regional or subregional plan for employer engagement and career awareness in the K-12 pipeline could outline how to coordinate, build upon, and align agricultural/STEM education curriculum, agricultural/STEM competitions, career awareness and exposure. Initiatives could occur in individual schools, at a broader community level or regionally. The audience would include administrators, teachers, career counselors, parents, and students.

In addition to New York State Education Department's (NYSED) offerings of career and technical education curriculum modules and project-based learning exemplars, a regional plan may consider scaling and coordinating the following campaigns that currently exist in the Southern Tier:

- 4-H, the youth development program of the US Cooperative Extension System and the United States Department of Agriculture with the backing of more than 100 public universities across the nation, offers extensive career readiness and STEM programs to those ages 8 to 18.
- New York Agriculture in the Classroom (NYAIC) offers an Agricultural Literacy Curriculum Matrix, which is an online tool that contains standards-based curriculum for K-2 teachers. NYAIC also provides lesson plans, activities, and resources that could be the basis of a regional plan for employer engagement and career awareness initiatives for the K-12 pipeline.
- Future Farmers of America (FFA) offers leadership, career, and technical skills training through a slate of programs, including the supervised agricultural experience (SAE), a strong example of work-based learning.
- New York Association of Agricultural Educators maintains the standards of agricultural educators at the secondary and post-secondary levels while also promoting agricultural education throughout the state of New York.

Potential partners: NYS DOL and government affiliated workforce agencies, NYS Department of Agriculture and Markets, NYS Education Department, NYS School Boards Association, school districts, BOCES, P-TECH major industry/commodity associations, employers, and educational non-profits

► **Expand dual-enrollment, job shadowing, experiential learning, and pre-apprenticeship programming.**

Promoting and scaling dual-enrollment programs in technical disciplines can create accelerated pathways for high school graduates who are not university-bound. Coupled with job shadowing, experiential learning and pre-apprenticeships, this approach can make an immediate talent impact on attracting more students to the industry. The challenge here is to connect these events back to actual career opportunities.

The Greater Southern Tier STEM Academy is successful example of collaboration between education and industry partners that leads to better career opportunities, especially for more vulnerable students.

Potential partners: BOCES, P-TECH, school districts, employers, and industry partners

► **Establish local industry ambassador training programs.**

Peer-to-peer ambassadors can provide a deeper connection to the reality of a potential job opportunity. A regional program could train and deploy industry ambassadors with the faces, voices, and stories of local communities and target populations. Their stories are most powerful when told in person and should also be featured in marketing materials. These industry ambassadors could also support more traditional farmers in the adoption of new technologies.

Potential partners: Industry/commodity associations and employers, local chambers and economic development organizations

Goal 3: Expand outreach and training to support the evolution of Agribusiness.

Agribusiness employers and educators in the Southern Tier are struggling to implement and sustain advanced training opportunities, due in part to the industry's slow transition and gradual adoption of technology-enabled farming methods. Conversely, the limited availability of talent may be a barrier to advancing the industry through these technology-enabled farming methods. A farmer surveyed in an adjacent region said "Things like robotics are great, but you have to have someone to fix your robot when they are not working. This creates a challenge. There isn't a broad base of people who can serve [the robots]."

A coordinated regional effort will be required to produce the talent and career pathways necessary to meet evolving industry needs. At the same time, increasing buy-in, support, and promotion of work-based learning and reskilling opportunities could support placement of job seekers in the Southern Tier into higher-paying career opportunities within the Agribusiness industry.

Some considerations when implementing outreach and training support include:

- ▶ Evolving the Agribusiness industry will require adoption from existing producers, processors, and manufacturers and the recruitment and growth of businesses already using or developing advanced farming and manufacturing techniques. Outreach efforts to inform current employers in Agribusiness of the capabilities and resources will require direct contact in many cases.
- ▶ As the industry transforms to incorporate more technology and additive methods of production, so will the processes of recruiting and developing talent. Aligning career pathways across high school, training facilities, the local BOCES, community colleges, and four-year institutions is critical with the current and future industry.
- ▶ Awareness of training opportunities to potential and existing employees is a critical piece of the puzzle. Like employers, participants need to understand the opportunities available and the long-term benefits of participation. These opportunities can be promoted on a central career platform, at career events, through targeted outreach programs, or at internal employer events.
- ▶ There is an opportunity cost for employees engaging in sponsored and non-sponsored trainings, especially if job placement is uncertain and the industry continues to offer wages below the regional average. Scholarships or stipends could reduce those costs and provide incentive for participation.



Assessment of training support and outreach in the Southern Tier

The support available for training and outreach was one aspect of the workforce ecosystem explored during our research on the region and in conversations with regional stakeholders.

Our main takeaways from that research were:

- ▶ Despite the efforts to raise awareness of Agribusiness career opportunities among the K-12 cohort, regional four-year institutions produce talent and research that may not connect with Southern Tier's local employers. The attrition of skilled talent from the region was a constant theme in stakeholder conversations. This is directly reflected in positions and programs related to veterinary care, animal care, CEA technicians, and processing technicians where the region currently produces a surplus of these occupations but stakeholder expresses a limited available talent.
- ▶ The Southern Tier has identified its emerging sectors for Agribusiness to be in controlled environment agriculture (CEA), robotics and automation, novel crop production, and supply chain technology. These emerging sectors will need pipelines of talent to be successful. Meeting these demands will necessitate the development of career pathways and the relevant trainings at all levels to support them.
- ▶ Currently, career pathways, especially for target populations and job seekers without a college degree, are limited to relatively low-paying roles (e.g., farmworkers and laborers, packaging and filing machine operators). Regional community colleges offer a limited amount of associate's degree programs that support areas of agricultural production, and many of these training resources are underutilized and disconnected from employers, Cornell CALS, and CCE. Adult education, micro-credential programs, apprenticeships, and training offered by the local BOCES and community colleges could be an elevated consideration for potential job seekers, employers, and industry leaders, especially as career pathways are developed for the future of Agribusiness.
- ▶ Awareness of innovation resources and training opportunities is a challenge for employers and job seekers. A singular platform that aggregates innovation resources, training and work-based learning programs within the Agribusiness industry sector, coupled with an outreach program that enumerates the benefits of innovation and skills advancement for employers and job seekers, could alleviate this issue.

Potential opportunities

The following are opportunities that the Southern Tier could explore to support outreach and training in the Agribusiness industry.

- ▶ **Dedicate personnel to conduct outreach to Agribusiness employers.**

A concierge-type role could be created for conducting outreach, education, and support for Agribusiness employers in the implementation of advanced farming techniques and related work-based learnings and reskilling opportunities. These concierge-type roles could also work to expand, improve, and formalize business relationships with secondary and post-secondary educators, innovation hubs, local workforce development boards, and training facilities.

These concierge roles could promote valuable resources like the Southern Tier Agriculture Development Fund for investments in Agtech and the Southern Tier Agriculture Education Fund to support workforce development the industry.

Potential partners: ESD and OSWD, NY DOL and other workforce agencies, Department of Agriculture and Markets, Cornell CALS and CCE, other universities and community colleges, BOCES, P-TECH, learning centers/labs

► **Develop new career pathways and trainings to support emerging sectors of Agribusiness.**

Post-secondary institutions and regional training facilities could consider developing new training programs and partnerships to support careers pathways in Southern Tier's emerging sectors of Agribusiness. Increasing the support, development and promotion of apprenticeship programs for careers in Agribusiness, Agtech and related industries may also be a consideration.

Proposed educational programs

The Upstate Revitalization Initiative Plan suggested the following programs to support the emerging needs in Agribusiness:

- Beef Industry Certificate
- Viticulture NYS Certified Apprenticeship Program
- Controlled Environment Training Program
- Urban Agriculture Module

Potential partners: New York Department of Labor, Department of Agriculture and Markets, Cornell CALS and CCE, other universities and community colleges, BOCES, major industry/commodity associations, employers, and learning centers/labs and educational non-profits



PluggedInVA

The PluggedInVA and Integrated Education and Training (IET) blueprint are models for career pathways that integrate academic and literacy skills, workforce preparation activities and occupation training through simultaneous co-enrollment in adult education and post-education and training.

► **Connect shorter-term agriculture-related training with programs supporting target populations.**

There are a number of programs in the Southern Tier that target disadvantaged and historically marginalized populations to include women in lower-income, majority-minority communities, veterans, at-risk youth, persons with disabilities, those in recovery from substance abuse, and justice-involved individuals. Examples include the Broome County Reentry Task Force (BCRTF), The Collaborative Recovery Empowerment of the Southern Tier (CREST) and Grow Binghamton Youth Program.

Connecting shorter-term Agribusiness training to these existing support programs and other industry-specific programs (like the Groundswell Incubator Farm program and the Cornell Small Farms program) could support more accessibility and mobility in the industry as it evolves. These could include basic Good Agricultural Practices (GAP) training and CEA technician certificates and could expand as more entry-level pathways are developed for the future of Agribusiness. Integration of wraparound services during these training is imperative.

Potential partners: NY DOL and other workforce agencies, Department of Agriculture and Markets, major industry/commodity associations, employers, Cornell CALS and CCE, other universities and community colleges, BOCES, P-TECH, and special program leads and community-based organizations

► **Develop cooperative (co-op) education programs in select program areas.**

Southern Tier produces a surplus of key occupations but still may struggle to fill those positions locally. A greater emphasis on cooperative education programs could provide the local connection that employers need to retain some of the talent produced in the region.

Potential partners: NY DOL and other workforce agencies, major industry/commodity associations, employers, related technical instruction providers, and local higher education

About cooperative education programs (co-ops)

Co-op programming is characterized by close collaboration between institutions of higher education or training organizations, and employers. Traditionally, co-ops combine classroom instruction in varying modalities with hands-on learning as a part-time employee with an employer. It is not uncommon for co-op students to receive academic credit for demonstrated competencies during employment. Most co-ops provide financial support or sponsorship of students, sometimes in the form of stipends, allowances for tuition and books, or traditional wage scales paid by the employer. In many cases, internships have replaced co-ops, but a recent resurgence among employers seeking talent solutions has shown promise for this model.



Select examples of successful wraparound service initiatives

Coordinated services	<p>SURGE Center, Goodwill Industries of Greater Detroit</p> <p>Designed to support employees with managing personal challenges that may impede job retention, the SURGE Center formally partners with employers through a memorandum of understanding that align with the organization's workforce goals and needs. Employees receive assistance with sourcing several resources, including reliable transportation, affordable childcare, substance abuse treatment.</p>
Childcare	<p>Project Growth Business-Childcare Partnership Tool Kit, Wisconsin</p> <p>Wisconsin's Project Growth grant program collateral included the Business-Childcare Partnership Tool Kit. It provides employers with strategies and resources for building childcare capacity, building partnerships, assessing financing strategies, ensuring sustainability. The toolkit can also serve childcare providers, as it defines their role in the workforce development ecosystem.</p>
Transportation	<p>Corporate ESG/Social commitments, Austin, TX</p> <p>As part of a local employer's ESG initiatives, \$1.5 million has been earmarked for a national rideshare-sponsored program that provides reliable potential employees reliable transportation to get job training, interviews, or wraparound services. Leaders in Austin, TX have been successful in channeling a portion of that corporate investment into helping local job seekers overcome barriers to employment, including transportation.</p>
Coaching	<p>Career Coach Pilot Program, Arkansas Tech Institute (ATI)</p> <p>ATI, an entity of Arkansas Tech University, is executing on its regional workforce development strategy connecting students with local industry and career opportunities. Over the course of the 2022-23 school year, six career coaches will help high school seniors navigate career pathways. The career coaches are made possible partnerships between the Arkansas Department of Education, a local educational cooperative, local school districts, and the local chamber of commerce.</p>
Income stipends	<p>Renewable Energy and Efficiency Workforce (RENEW) Training Program, City of Charlotte</p> <p>The City of Charlotte, with the support of the Urban League of Central Carolinas, sponsors a 13-week training in the area of HVAC and electrical trades. In addition to career coaching for a paid work-based opportunity, participants earn an educational stipend of \$15/hour during the training period.</p>



Agribusiness Strategy Implementation

Key stakeholders in the workforce ecosystem were convened to both contribute to the REDC's annual report and to support the scope of this project. Many of those stakeholders will also play an essential role in the scaling of existing programs or the development of new programs that can make a positive impact on targeted workforce development efforts in the region. Collaboration and coordination across the workforce ecosystem will be integral to the successful launch of potential opportunities outlined in this strategy report.

A key consideration in strategy implementation will be the timelines, eligibility, and organization of tasks necessary to successfully apply for current and future programs administered by the Office of Strategic Workforce Development.

The Southern Tier REDC is best positioned to serve as a champion and convener of this strategy. In doing so, it would support the regional efforts of the existing workforce ecosystem by convening partners to identify and execute initiatives aligned with the regional economic and workforce priorities. The REDC would also provide ongoing guidance regarding current and future grant programs. The following considerations and steps have been developed to assess the feasibility of current and future initiatives in an organized and quantifiable manner.

Project identification and considerations

In exploring future projects or initiatives, the Southern Tier REDC, regional stakeholders, grant applicants, and others should consider:

- ▶ Does the initiative have the potential of making measurable and positive impact on the development of a workforce pipeline in the target sectors? How?
- ▶ Does the initiative clearly demonstrate value in reaching underserved populations, displaced workers, ALICE workers, the underemployed, and similar demographics?
- ▶ Will the program include business and industry support in the form of direct placement, on-the-job training, industry credentials, or assistance in the development of training capacity?
- ▶ What steps are being taken to prevent duplication of efforts in the region? What individuals, entities, or organizations can assist in determining whether an existing project should be augmented or a new project considered?

Potential implementation steps

To the extent possible, it is suggested that project ideas and potential areas of collaboration be shared with the Southern Tier REDC to determine the best potential partners, identify existing and similar programs, and share guidance on the grant program and timelines. The Southern Tier REDC is likely in the best position to inform potential applicants of regional, economic, and industry developments that could benefit the grant application process or achieve economies of scale in certain efforts. In some cases, project ideas may not include utilization of current OSWD grant programs.

Step 1: Convene

The Southern Tier REDC has established convening ability in the region through their existing workgroups, and others have interregional capabilities that could be tapped as well.

- ▶ Project considerations could start with identifying the stakeholders, organizations, and/or individuals who could be included in preliminary discussions. The Southern Tier REDC and key subregional workforce agencies can serve as advisors for this process.

For example, the establishment of an employer-sponsored, short-term training program that focuses on the rapid upskilling of recent high school graduates would likely include the following entities in the Southern Tier region: employer, local community college or university, BOCES and local school district. Additional stakeholders such as wraparound service providers, curriculum or certification bodies, or others could be included as the design of the project progresses.

- ▶ Once potential partners are identified, outreach could be conducted to convene all potential project participants.

Step 2: Organize

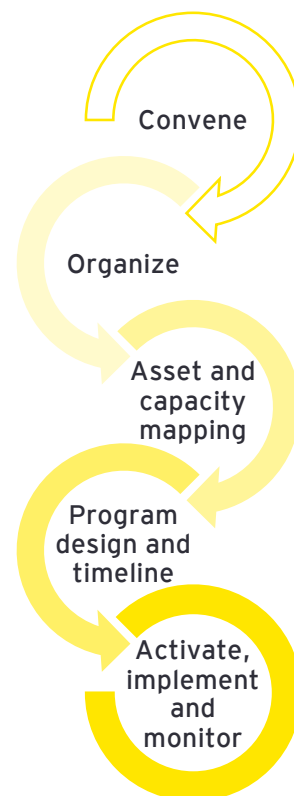
- ▶ Meet to discuss the project idea, scope, and preliminary goals.
- ▶ Establish the projects relevance to the identified tradeable sectors, based on ESD's guidelines and priorities.
- ▶ Establish a project lead, likely based on the focus of the project.
- ▶ For example, development of a new wraparound service could be led by an existing social service organization. The development of a new apprentice program could be led by a potential sponsor or employer.
- ▶ Organize all meetings to ensure communication, documentation, agenda items, and action items are well-documented and shared.

Step 3: Inventory assets and capacities

- ▶ Explore similar programs, leading practices, and determine required assets and capacities to successfully launch the project or initiative.

If utilizing OSWD grant programming, follow the application, documentation, and timeline guidance provided in the grant documentation.

- ▶ Assess capacity of stakeholders, ensuring all required elements of the program are in place. As part of the assessment, consider what entities have the ability to contribute financial, in-kind, space, or other resource support that is essential for the project.
- ▶ Identify gaps in funding, capacity, expertise, and other assets necessary to launch the program.
- ▶ Conduct outreach to identify additional capacity and/or assets, utilizing the Southern Tier REDC and other regional stakeholders as assets.



Step 4: Program design and timeline

- ▶ If multiple project ideas exist, the Southern Tier REDC can support prioritization based on the significance of need, workforce priorities, and established leading practices in the region.
- ▶ Program design could account for the comprehensive life cycle of the design, launch, administration, and monitoring of the program. Grant funding will require specific plans on each component.
- ▶ Metrics of success should be determined at the beginning of a program and be human-centered and impact-focused. During the monitor portion of a program, metrics could be assessed if they adequately capture intended impact and iterated upon if better metrics are identified. These metrics will vary from program to program, depending on grant requirements and the stakeholders involved.
- ▶ Concurrent to design, all efforts could be made to establish momentum, awareness, and inclusion of underserved populations and the integration of wraparound service providers. Both digital and grassroots efforts could be considered and deployed.
- ▶ Specific timelines and goals should be created that account for program goals, partner capacities, and regional workforce priorities.

Step 5: Activate, implement, and monitor

- ▶ Consider a launch event that can draw attention and result in immediate momentum for the project. Enlist support from industry, non-profit, educational, and government leaders.
- ▶ Monitor progress and efficacy of the program through established guidelines in operating agreements, focusing on administration and tracking of metrics and goals.
- ▶ Seek opportunities to scale the program through additional partners, assets, or marketing.

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Southern Tier REDC

Phase II Regional Sector-Based Strategies Research Appendix

Prepared by

Ernst & Young LLP

Economic Development Advisory Services

November 2022

1 Introduction

Introduction to Research Appendix

As part of the Phase II work to develop a Regional Sector-Based Workforce Development Strategy for the Southern Tier region of New York, EY produced new research and analysis to supplement research produced by Empire State Development (ESD) and the Regional Economic Development Council (REDC) during Phase I as well as previous reports.

This Research Appendix includes data and findings on the following:

- ▶ Regional workforce conditions
- ▶ Industry analysis on the two target sectors: Advanced Manufacturing and Agribusiness
- ▶ Occupational analysis of the two target sectors
- ▶ Educational programming that supports overall workforce development and the programming specific to the two target sectors

This supplemental research aims help to inform the workforce development planning process and the development of strategies for each of the target sectors.



Regional workforce conditions

About this chapter

In this chapter, we seek to understand the social and economic trends within the region, as well as validate potential barriers facing the community. We examine components of population growth, economic indicators, potential barriers to employment and regional migration. Key metrics in this chapter include:

- ▶ Population trends by year, age, and race/ethnicity
- ▶ Monthly unemployment rate
- ▶ Size of labor force by month
- ▶ Potential barriers to employment
- ▶ Migration trends
- ▶ Unemployment by year, age, race/ethnicity, and education level
- ▶ Labor force participation rate by year, age, race/ethnicity, and education level

Insights from this analysis can provide a high-level understanding of the talent pipeline and the region's ability to supply the labor needed to support Southern Tier's economy.

Key findings

- ▶ The population in Southern Tier has been steadily declining over the past decade, but a slight uptick occurred post-pandemic. Population growth has been attributed to growth in Tompkins County and in minority populations.
- ▶ Still, the region is predominantly White and has smaller minority populations and relatively few foreign-born residents.
- ▶ The region's retirement age population (65+) has grown the fastest, and the young professional population (25-44) is under-represented.



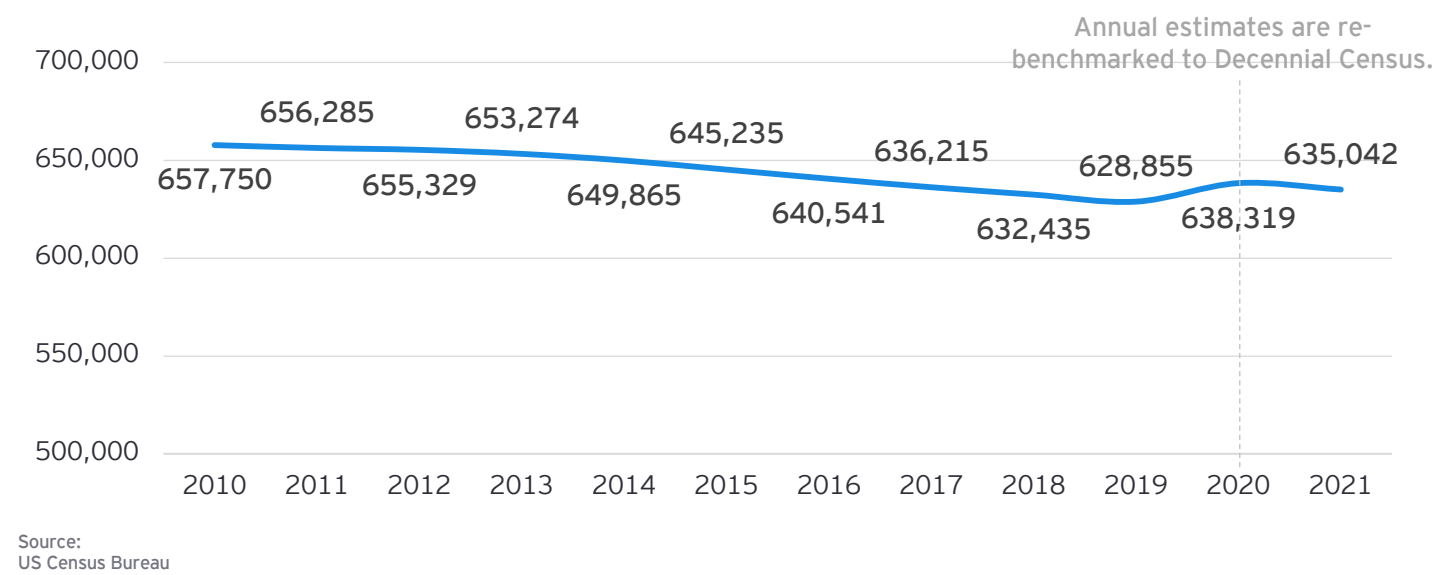
Regional workforce conditions

Key findings, *continued...*

- ▶ While unemployment rates have fallen to pre-pandemic levels, the size of the labor force has not fully recovered.
- ▶ Unemployment rates for Black and American Indian and Alaskan Native populations are twice as high as White unemployment; Hispanic and multi-racial unemployment is more than 50% higher while Asian unemployment is lower.
- ▶ The labor participation rate is lower in Southern Tier than the state average with labor participation rates for most minorities being lower than the state average; adults without a high school diploma are much more likely to be unemployed and out of the labor force in Southern Tier.
- ▶ Poverty levels are slightly elevated compared to the state average, and the region has a higher percentage of population with a disability.
- ▶ More than a quarter of residents commute out of the region for jobs with a slightly smaller number of workers commuting in for work who are not residents. Workers who commute into the Southern Tier are heavily weighted toward Production workers (HS or less) but also highly educated workers in A&E, Life Science and Computer/Math.
- ▶ Since the pandemic, Government, Accommodation/Restaurants, and Government lost the most jobs, but Administrative Support experienced the largest percentage decline.

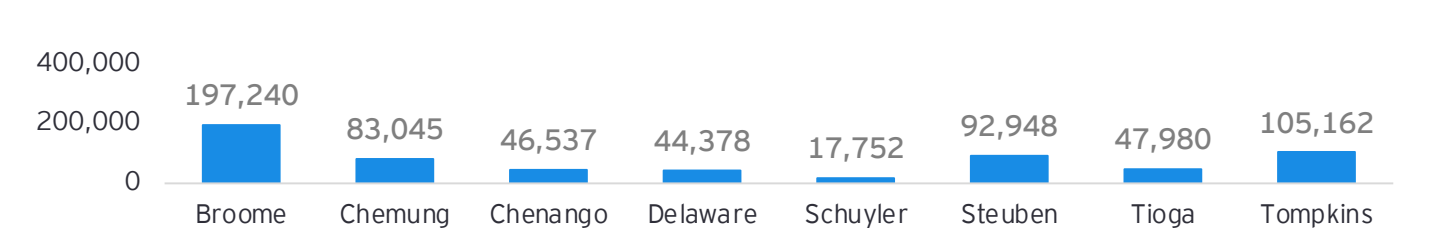
Southern Tier’s population has steadily declined but rebounded in 2021.

Population growth, 2010 - 2021

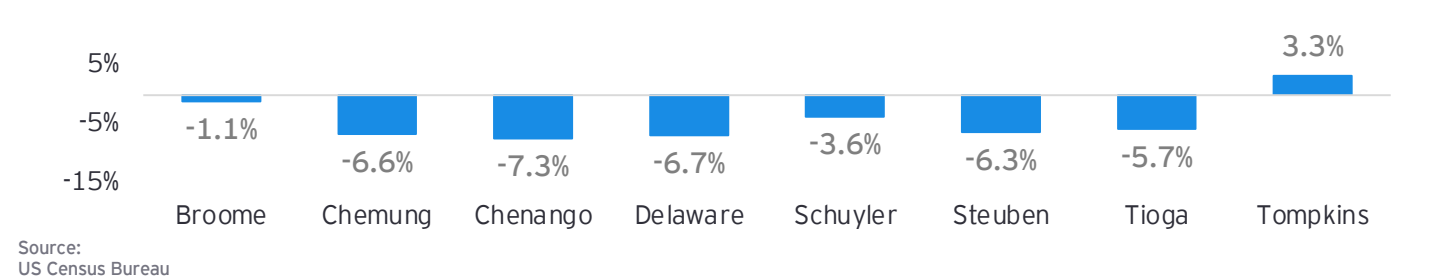


Tompkins County was the only county in Southern Tier to experience an increase in population over the past ten years. Broome County experienced the smallest decline.

Population, 2021



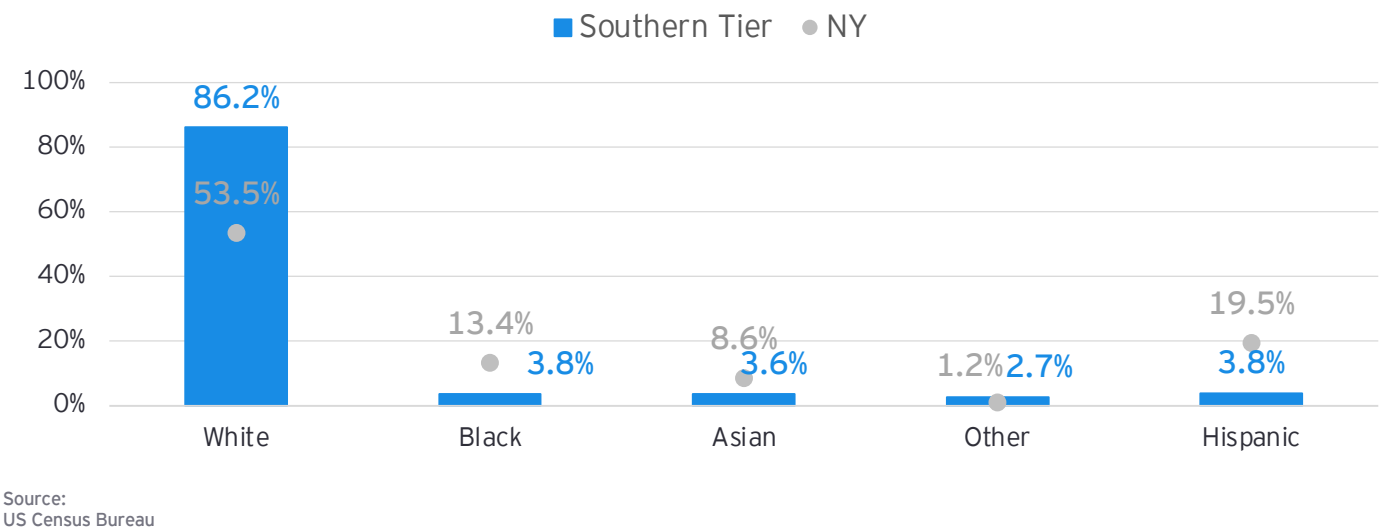
Population growth, 2011 to 2021



Workforce

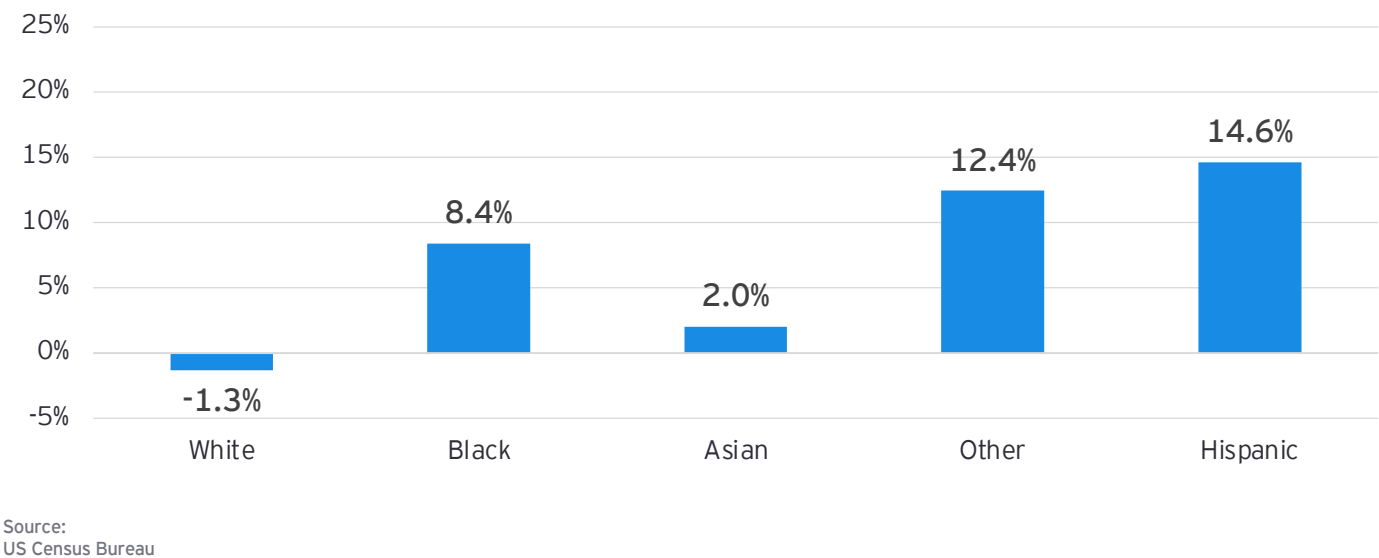
The population of Southern Tier is predominantly White. Minority populations are 3-4 times proportionally smaller in Southern Tier versus state averages.

Population by race/ethnicity, 2021



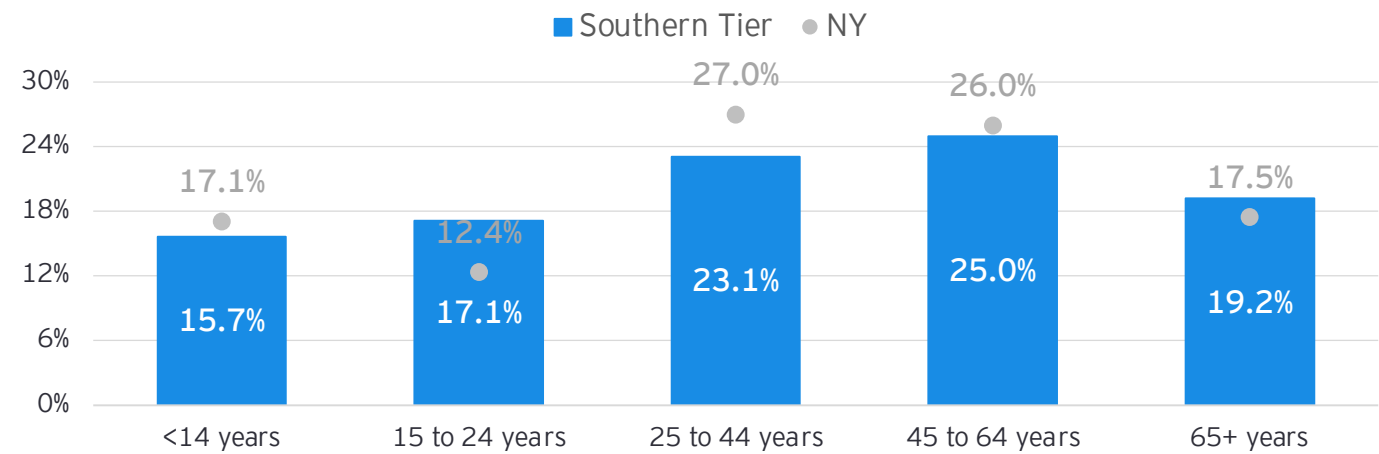
Still, the population of Southern Tier is becoming more diverse, with high growth in Hispanic, Other, and Black populations. The White (non-Hispanic) population is declining.

Population growth by race/ethnicity, 2016 - 2021



Southern Tier has a much higher share of teenage and college-age populations (15-24) than the statewide average, but a much lower share of young professionals (25-44).

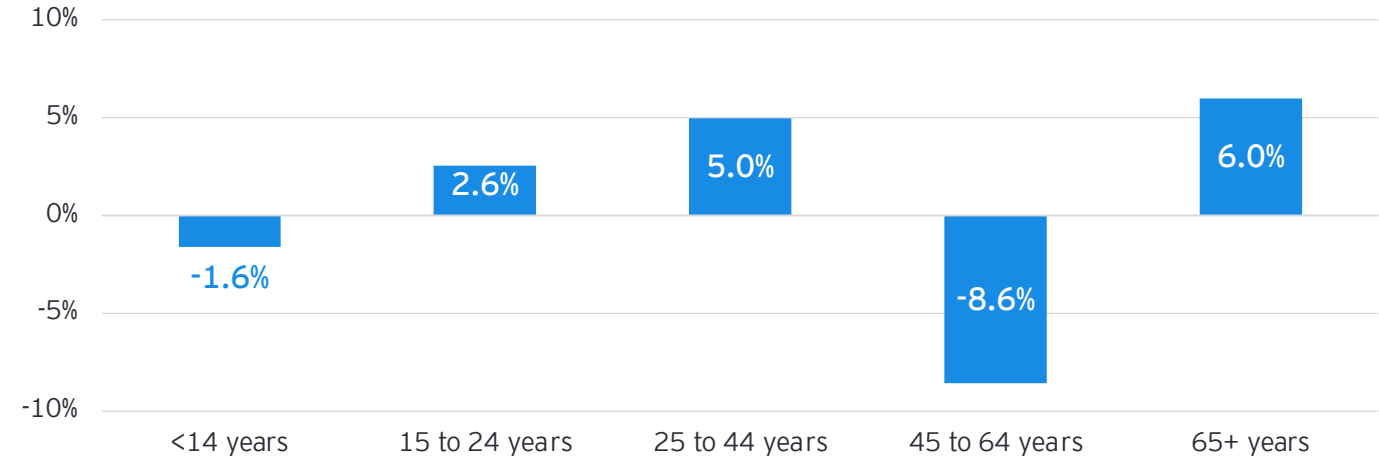
Population by age, 2021



Source:
US Census Bureau

Southern Tier’s retirement age population (65+) has grown the fastest in the past five years. The 45-64 age group declined significantly.

Population growth by age, 2016 - 2021

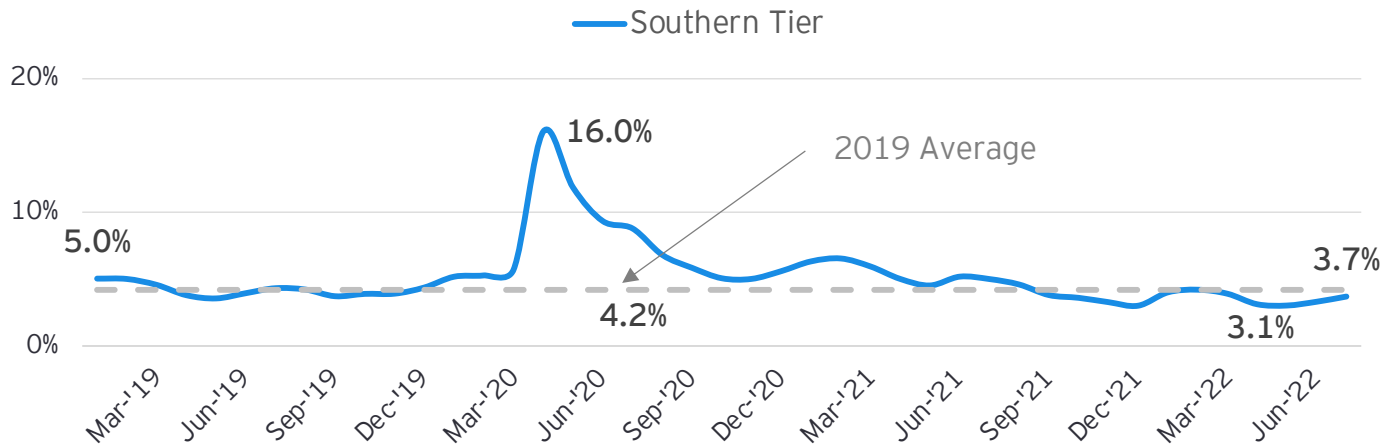


Source:
US Census Bureau



The unemployment rate in Southern Tier has fallen below pre-pandemic levels.

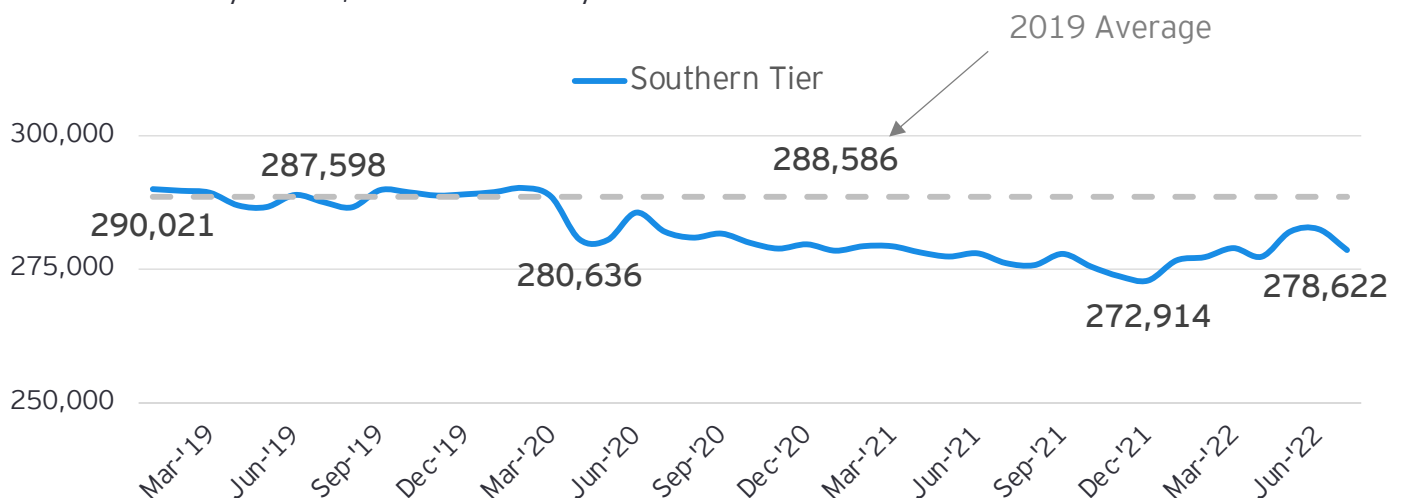
Unemployment rate by month, Jan. 2019 - July 2022



Source:
US Bureau of Labor Statistics

The labor force (those working or looking for work) in Southern Tier rebounded in 2022 after a sizeable decline during 2020/2021. Total available workers is smaller than pre-pandemic levels.

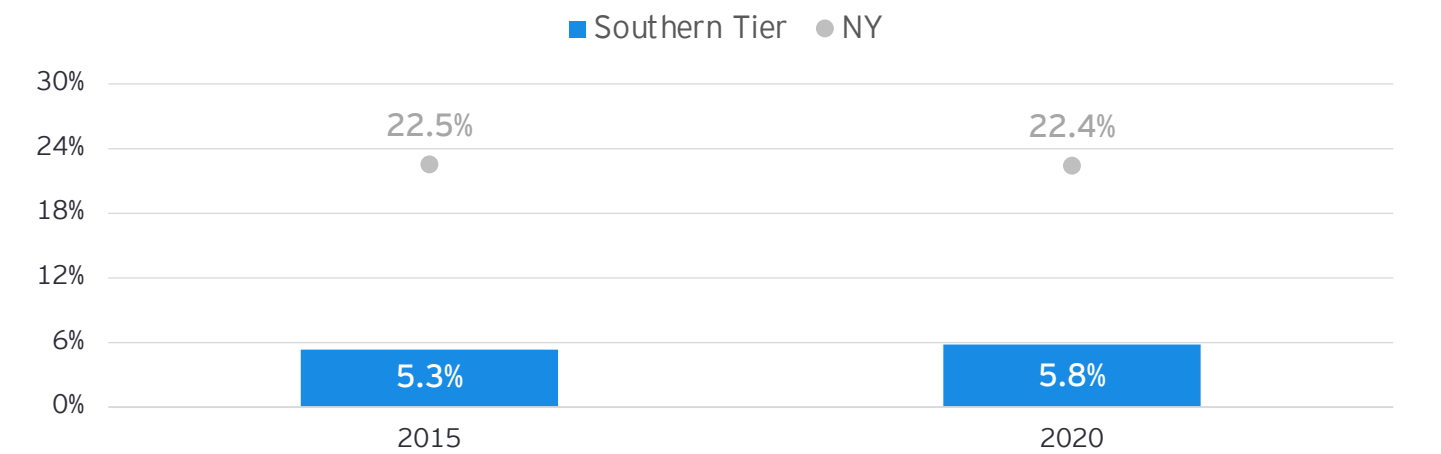
Labor force size by month, Jan. 2019 - July 2022



Source:
US Bureau of Labor Statistics

The foreign-born population in Southern Tier is much smaller than the state average but is growing.

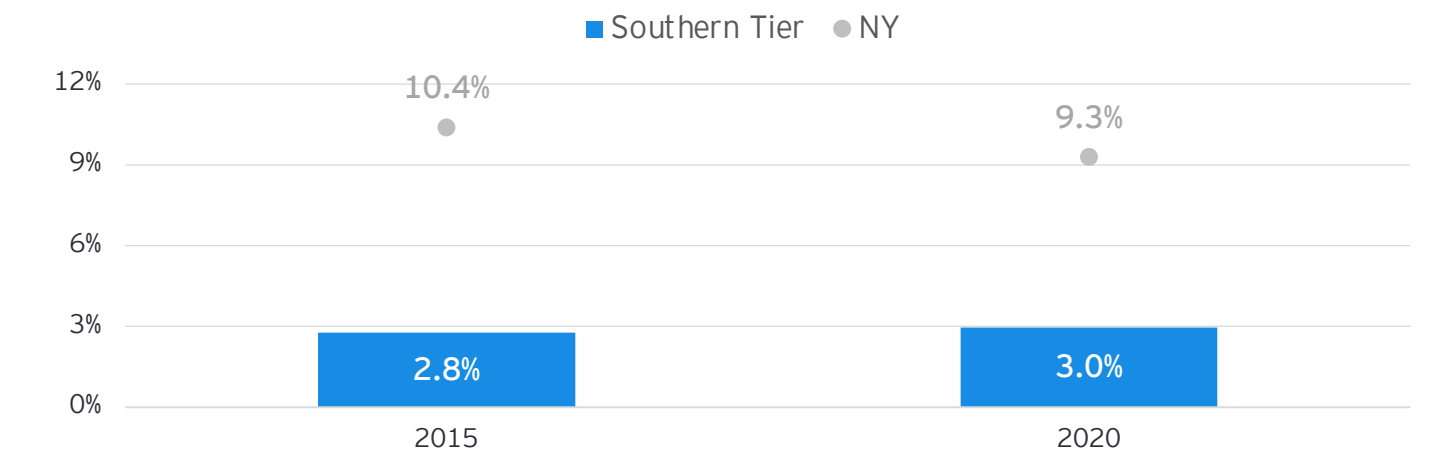
Foreign born as % share of population, 2015 - 2020



Source:
US Census Bureau

The share of non-U.S. citizens in Southern Tier is one-third the state average but is growing slightly.

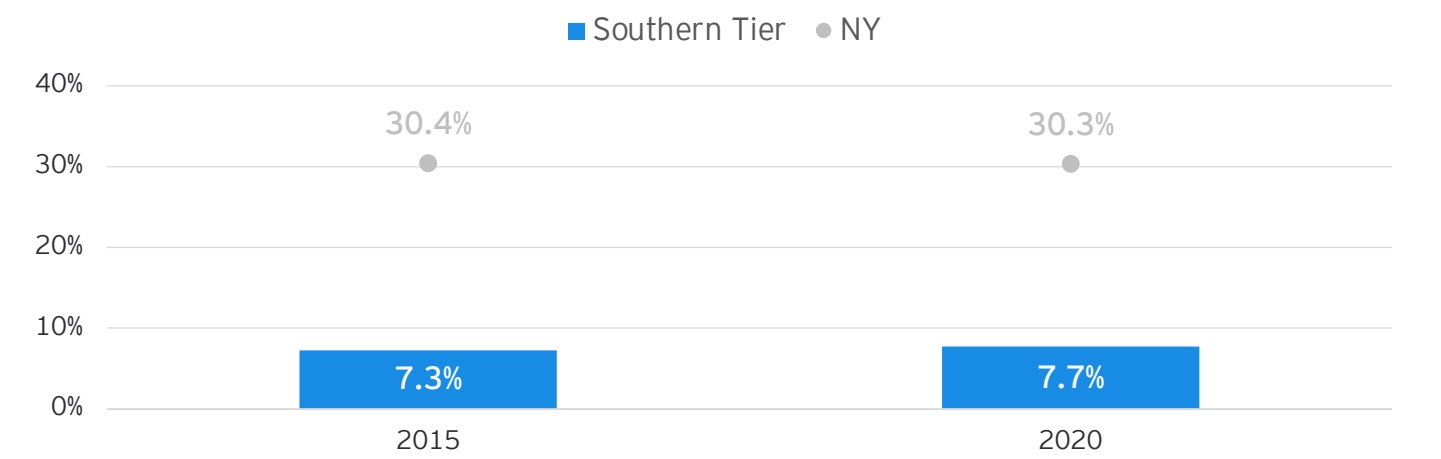
Non-Citizens as % share of population, 2015 - 2020



Source:
US Census Bureau

The share of people in Southern Tier speaking a language other than English is less than 8% (compared to 30% statewide) but is growing.

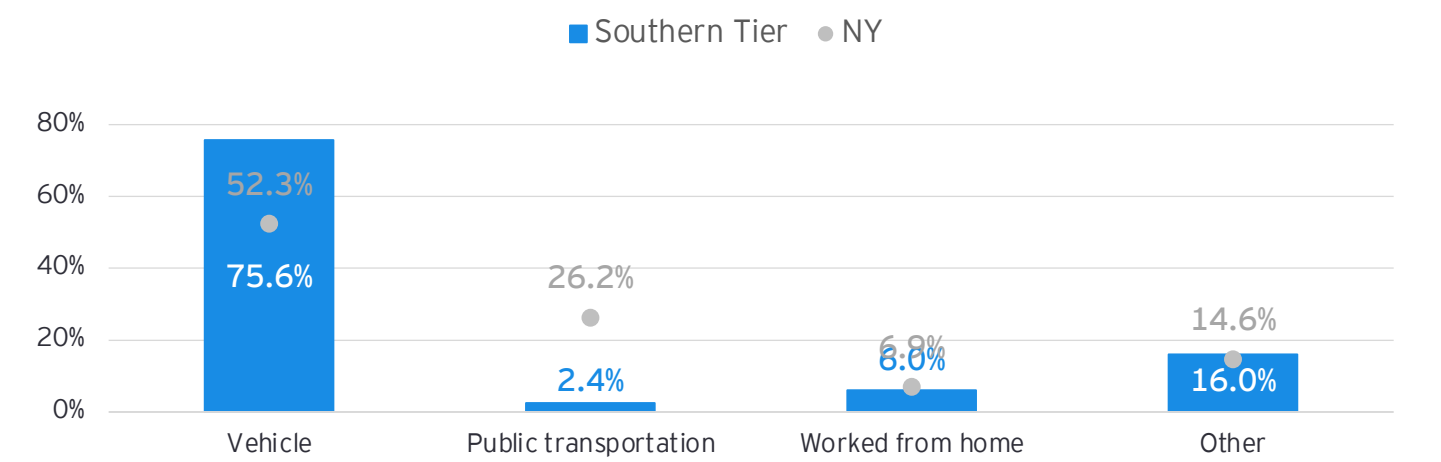
% of population that speaks a language other than English at home, 2015 - 2020



Source:
US Census Bureau

Southern Tier workers are heavily dependent on cars for their commute.

Modes of transportation to work, 2020

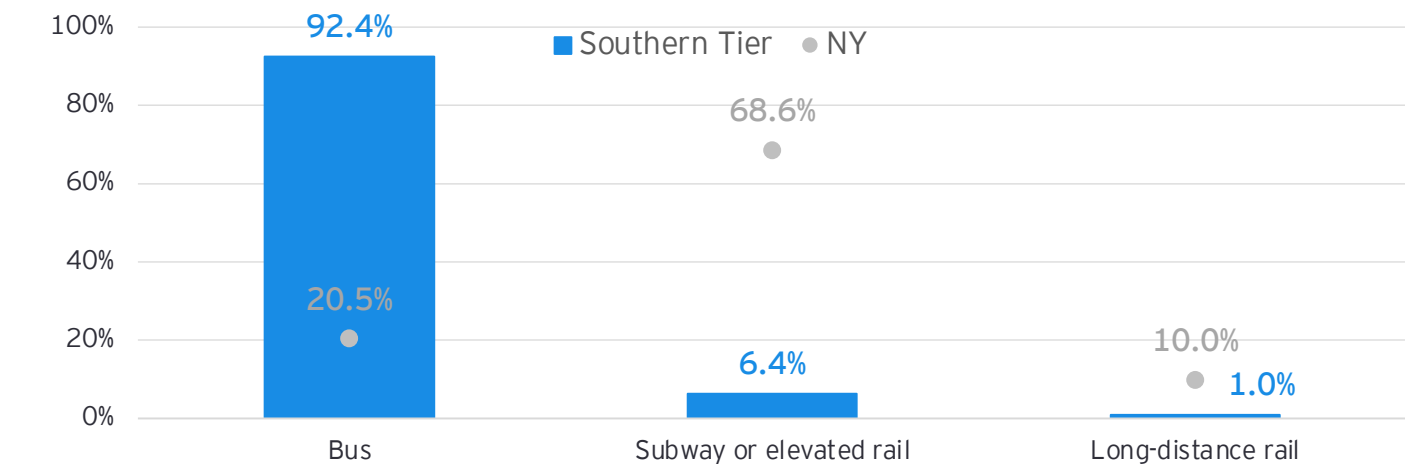


Source:
US Census Bureau



When public transportation is used by Southern Tier workers, more than 90% ride the bus.

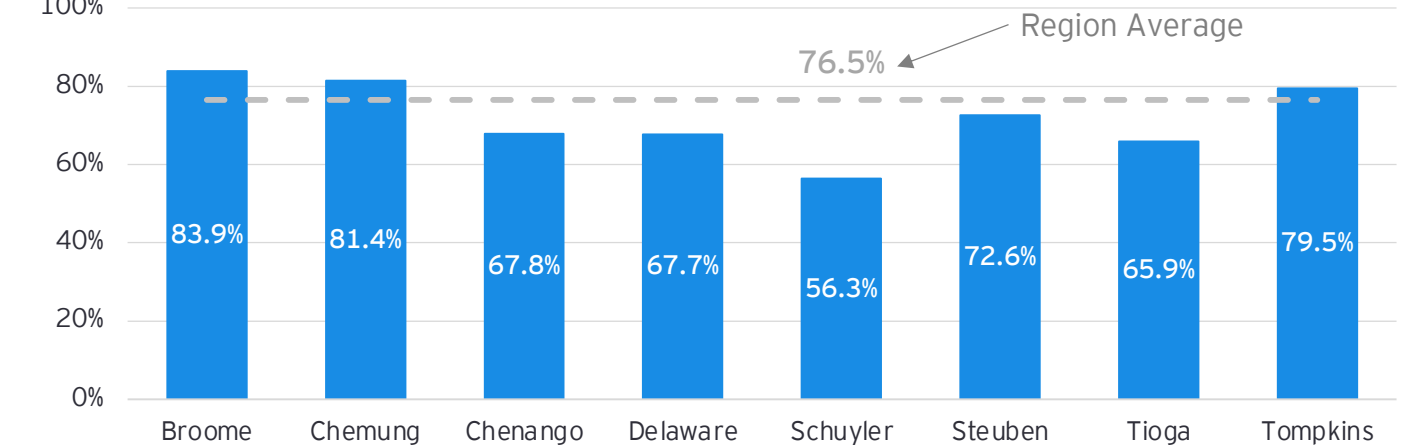
Types of public transportation used as share of total public transportation, 2020



Source:
US Census Bureau

Three-quarters of Southern Tier commuters have a commute of 30 minutes or less. Broome county workers have the shortest commutes, while Schuyler county residents have the longest commutes.

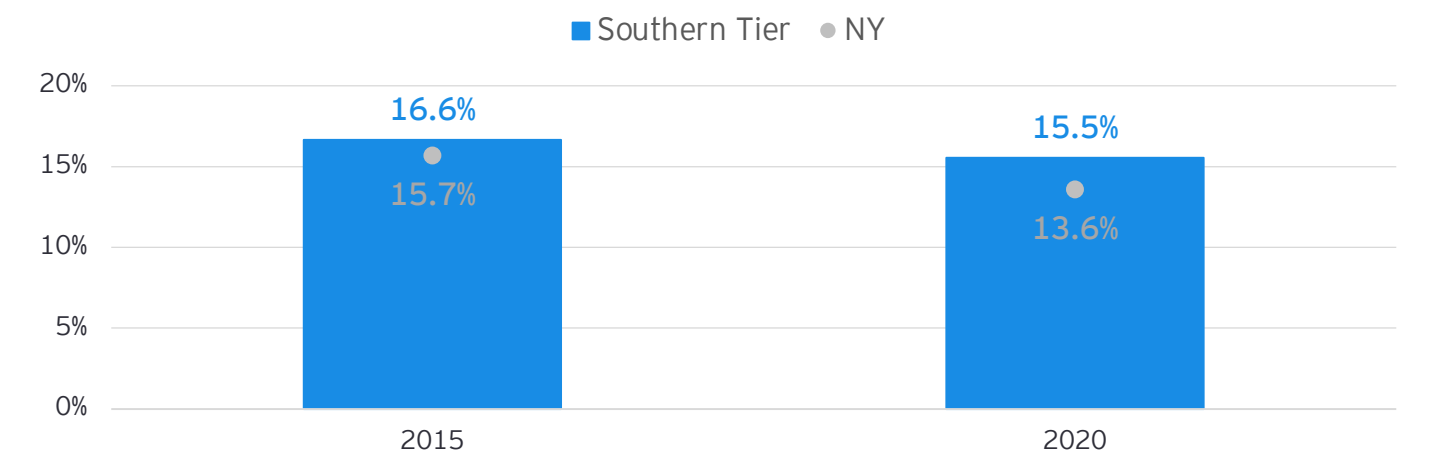
Share of commutes less than 30 minutes, 2020



Source:
US Census Bureau

Poverty levels are decreasing in Southern Tier but remain slightly above the state average.

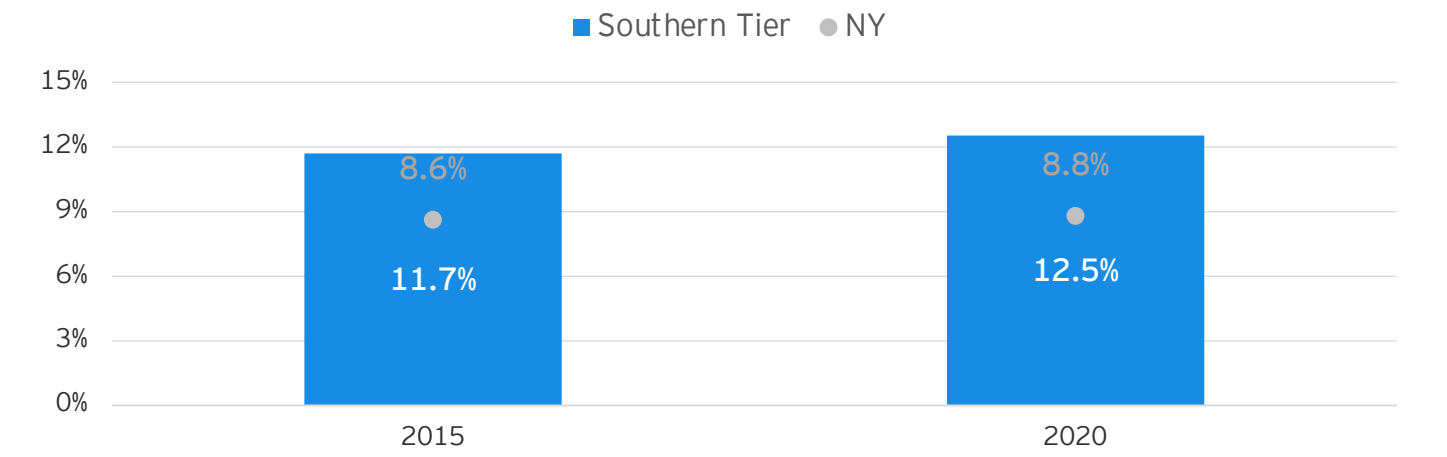
% of residents living in poverty, 2020



Source:
US Census Bureau

One in eight (12.5%) of Southern Tier residents have a disability, a much higher share than the state average.

Percentage of population with a disability, 2015 - 2020

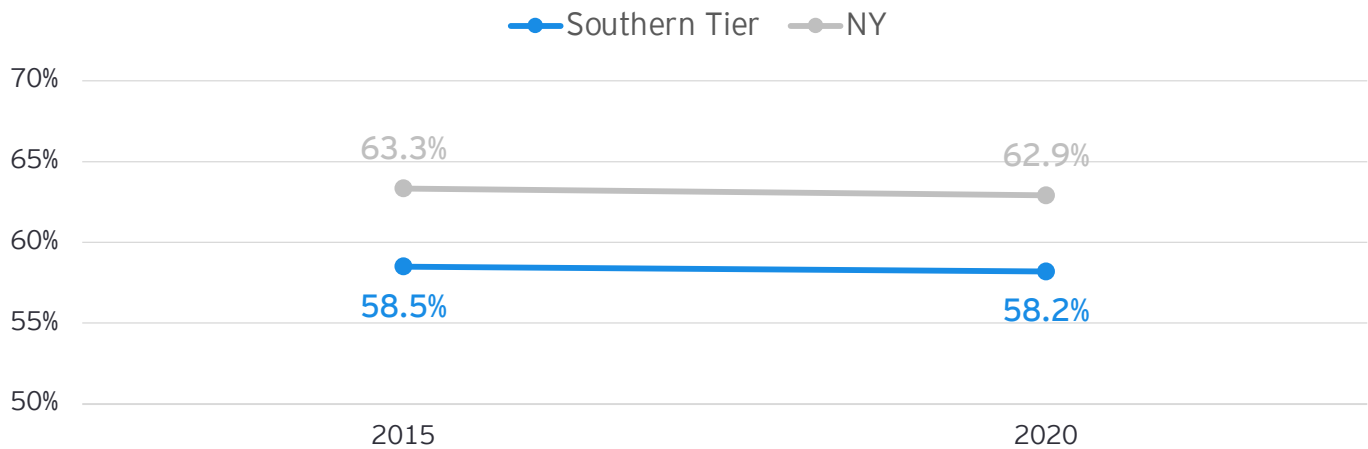


Source:
US Census Bureau

Workforce

The labor participation rate is much lower in Southern Tier than the state average. Less than 60% of residents of working age (16+) are in the labor force (either working or looking for work).

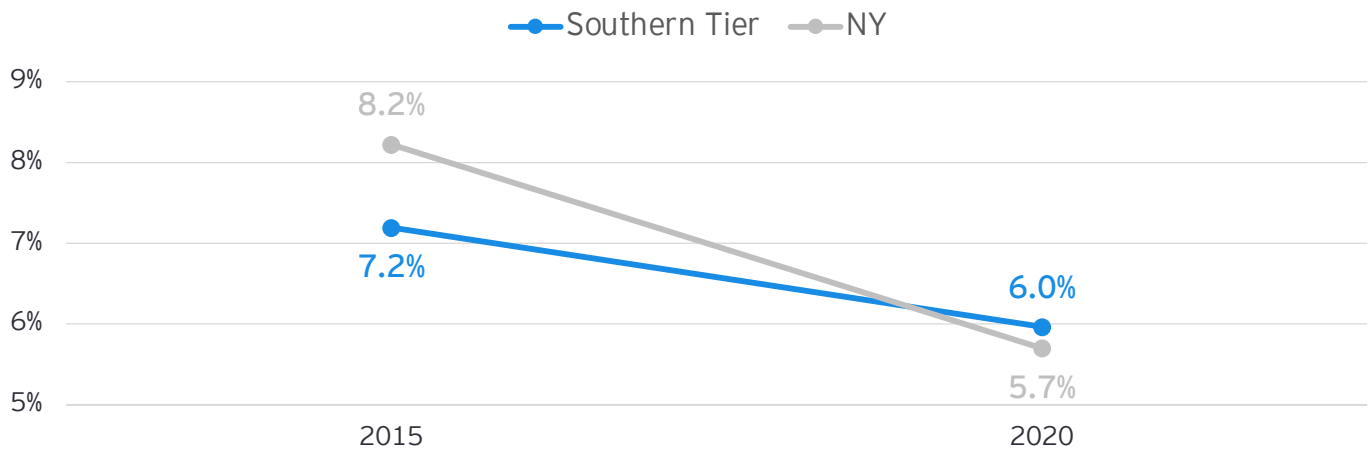
Civilian labor force participation rate 16+ years of age, 2015 - 2020



Source:
US Census Bureau

The unemployment rate in Southern Tier has decreased from 2015 to 2020 and is now slightly above the state average.

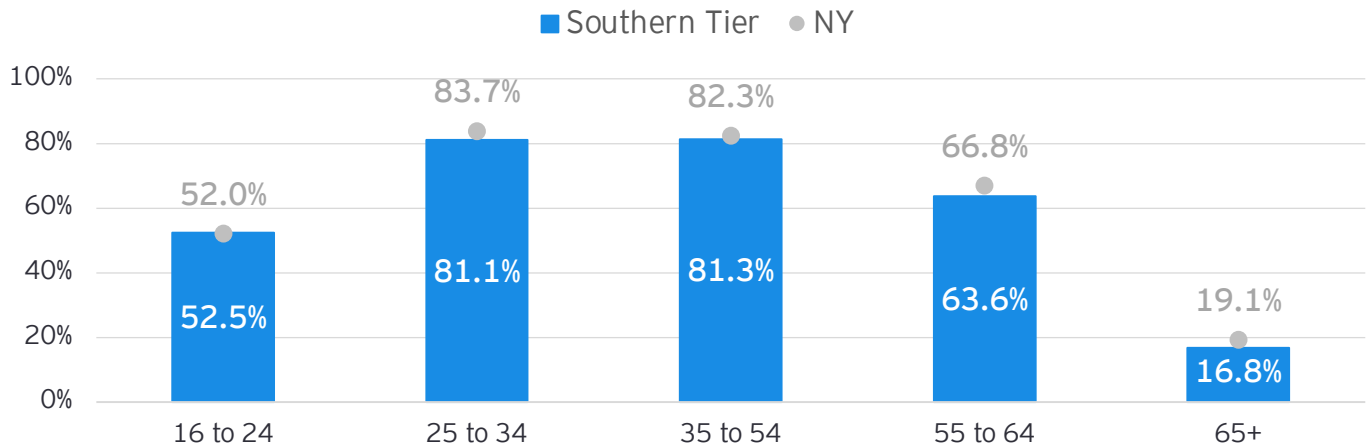
Unemployment rate 16+ years of age, 2015 - 2020



Source:
US Census Bureau

Labor participation rates in Southern Tier are highest for people in their prime working age (25-54). Older residents are less likely to be working compared to the state average.

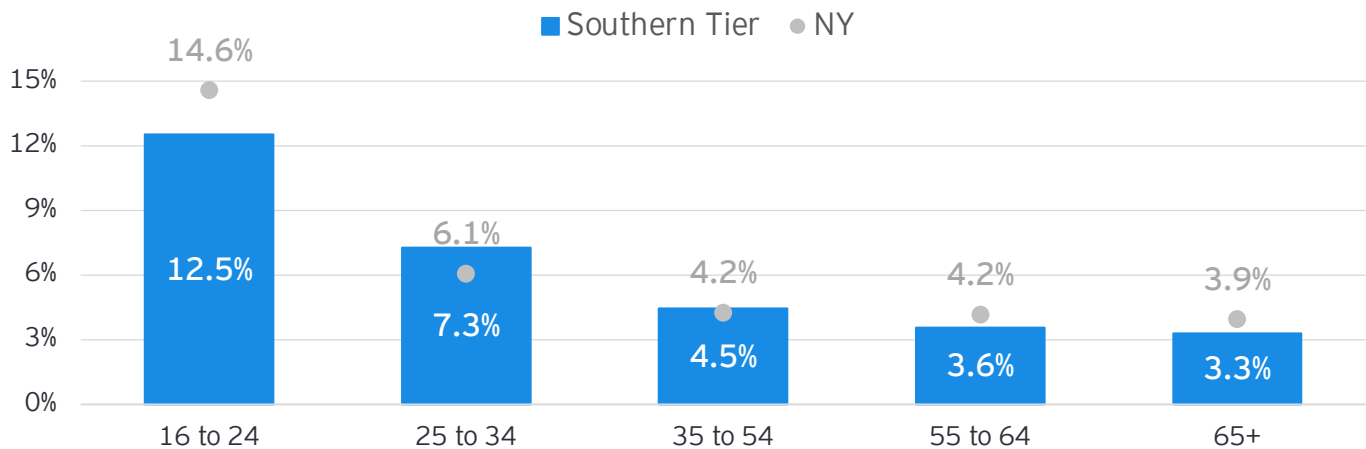
Labor force participation rate by age, 2020



Source:
US Census Bureau

The unemployment rate in Southern Tier declines as people get older. Young adult populations are more likely to be unemployed versus the state average, and older populations are less likely.

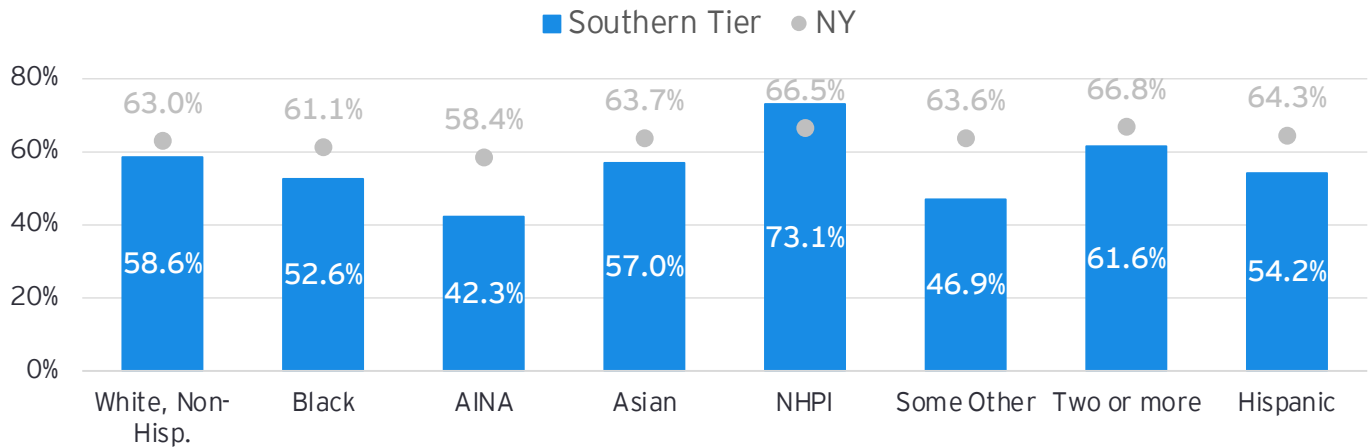
Unemployment rate by age, 2020



Source:
US Census Bureau

Labor participation rates are highest in Southern Tier for White and Asian populations and lower for minority populations, even when compared to state averages.

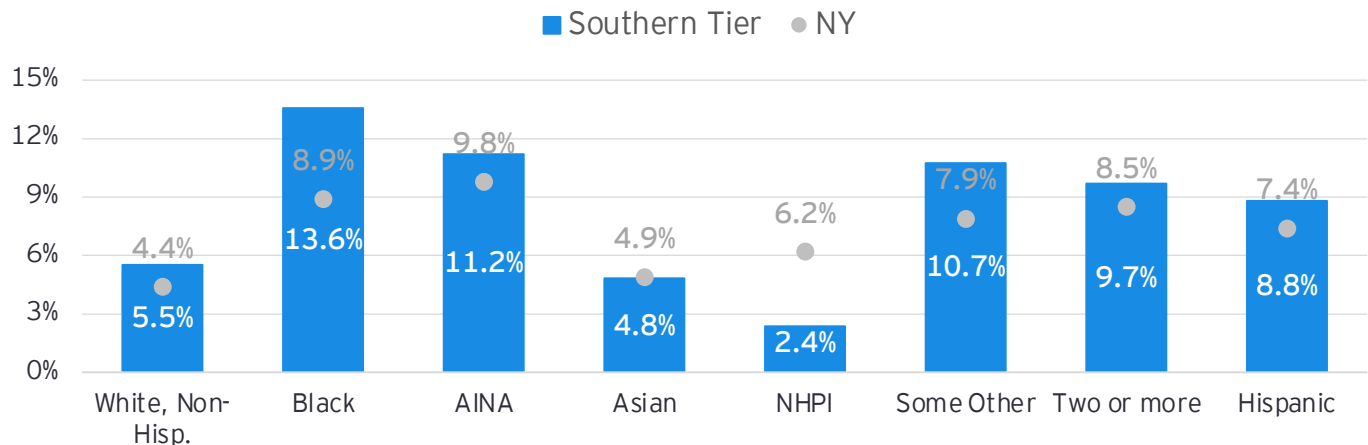
Labor force participation rate by race/ethnicity, 2020



Source:
US Census Bureau

Unemployment rates for minorities in Southern Tier are high and higher than the state average (exception: Asian and Pacific Islanders), but White Non-Hispanic unemployment is only slightly higher than the state average.

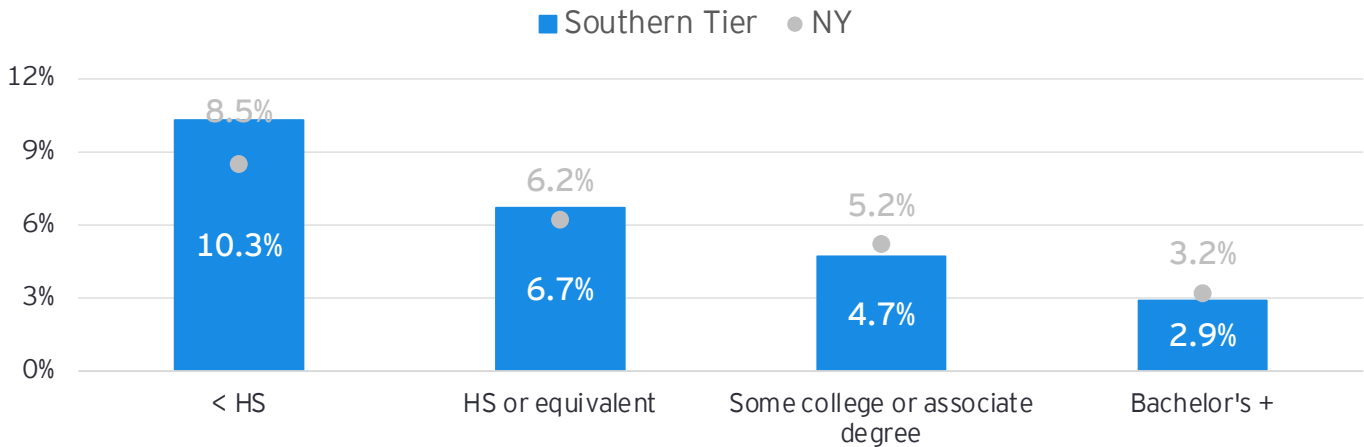
Unemployment rate by race/ethnicity, 2020



Source:
US Census Bureau

Unemployment rates in Southern Tier decline significantly with higher levels of education. Less-educated workers in the region have higher unemployment rates than the state average.

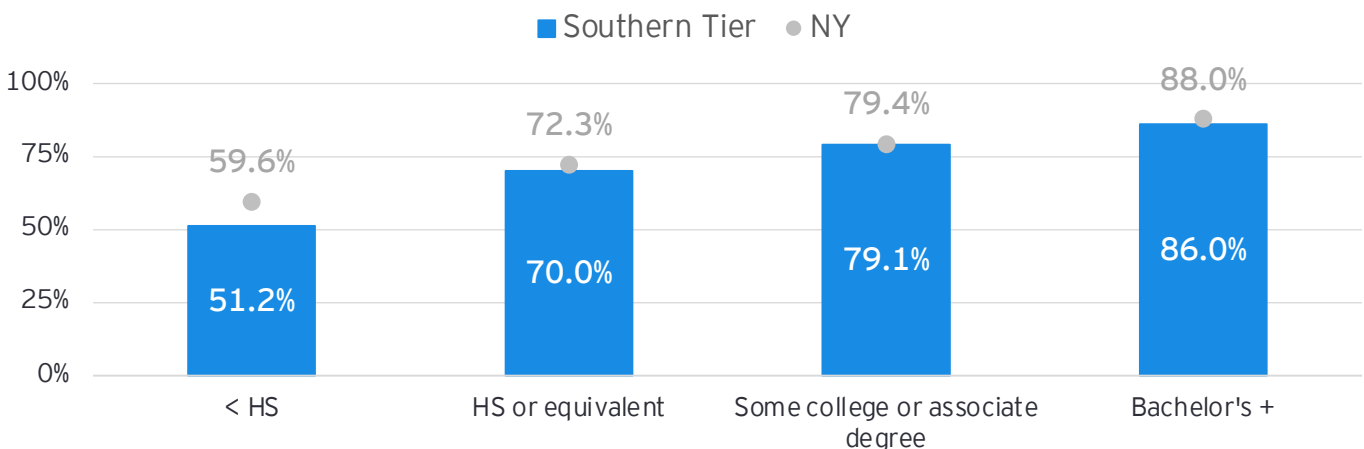
Unemployment rate by educational attainment, 2020



Source:
US Census Bureau

Labor participation rates increase as people have more education in Southern Tier. People without a high school diploma are much less likely to work in Southern Tier than across the state.

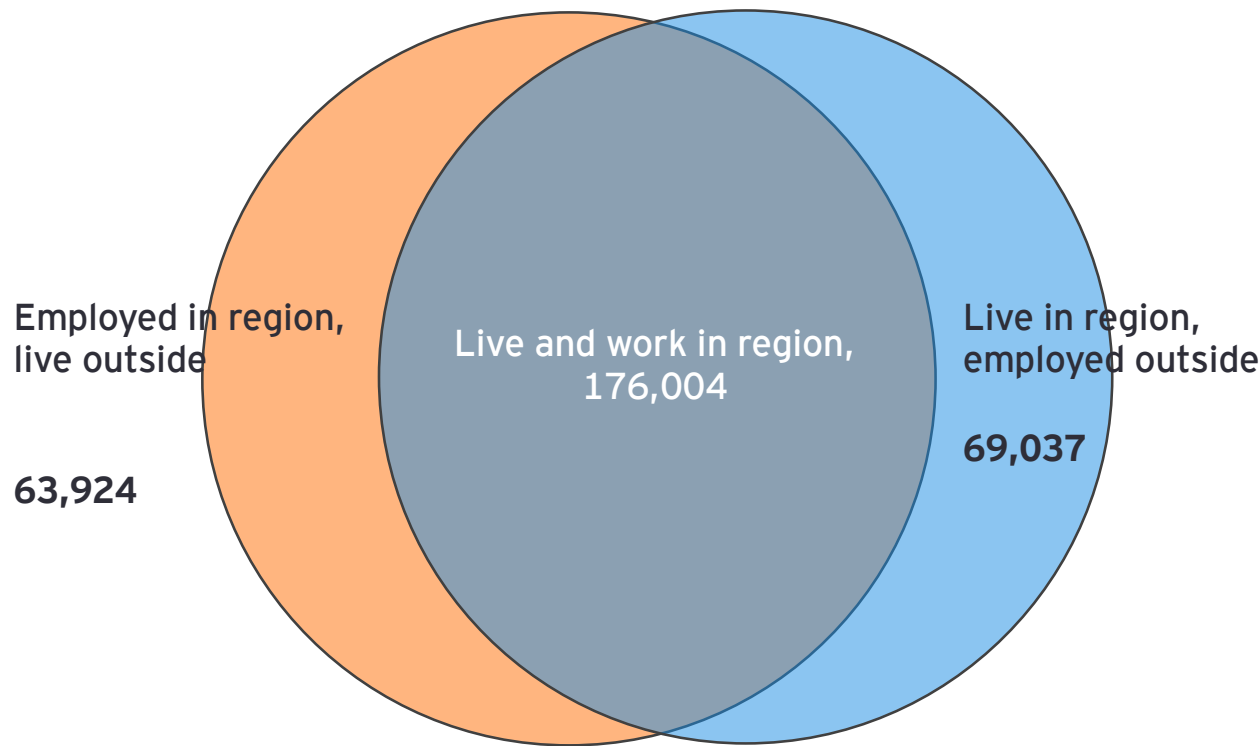
Labor force participation rate by educational attainment (aged 25 to 64), 2020



Source:
US Census Bureau

Thirty-nine percent (39%) of workers living in Southern Tier commute out of the region every day (or work remotely for jobs elsewhere). A smaller percentage of workers commute in.

Talent inflow/outflow, 2019



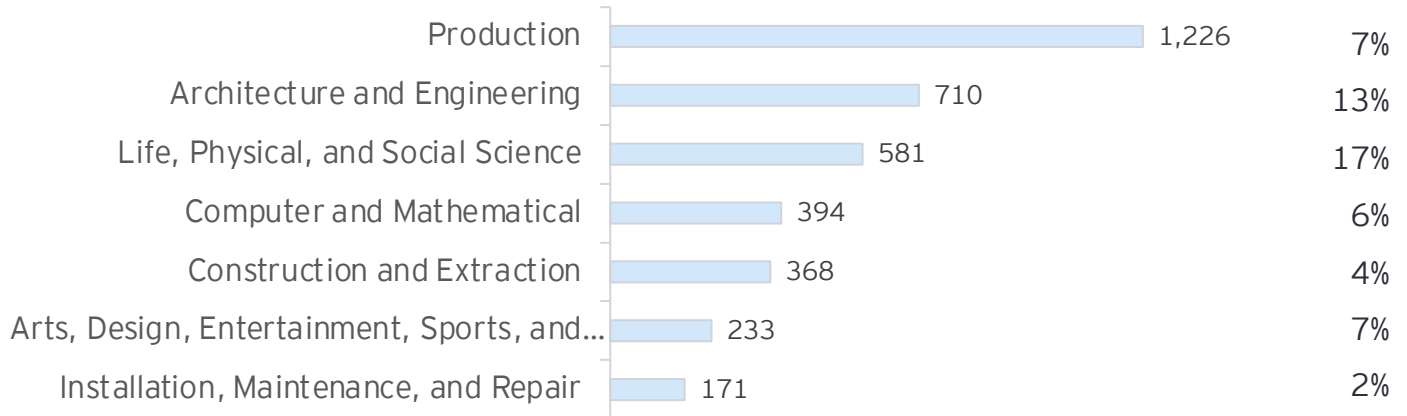
Source:
US Bureau of Labor Statistics



Workers who commute into the Southern Tier are heavily weighted toward Production workers (HS or less) but also highly educated workers in A&E, Life Science and Computer/Math. Workers who commute out of the region for jobs are in Sales, Food Preparation, Health Care Support, and Education.

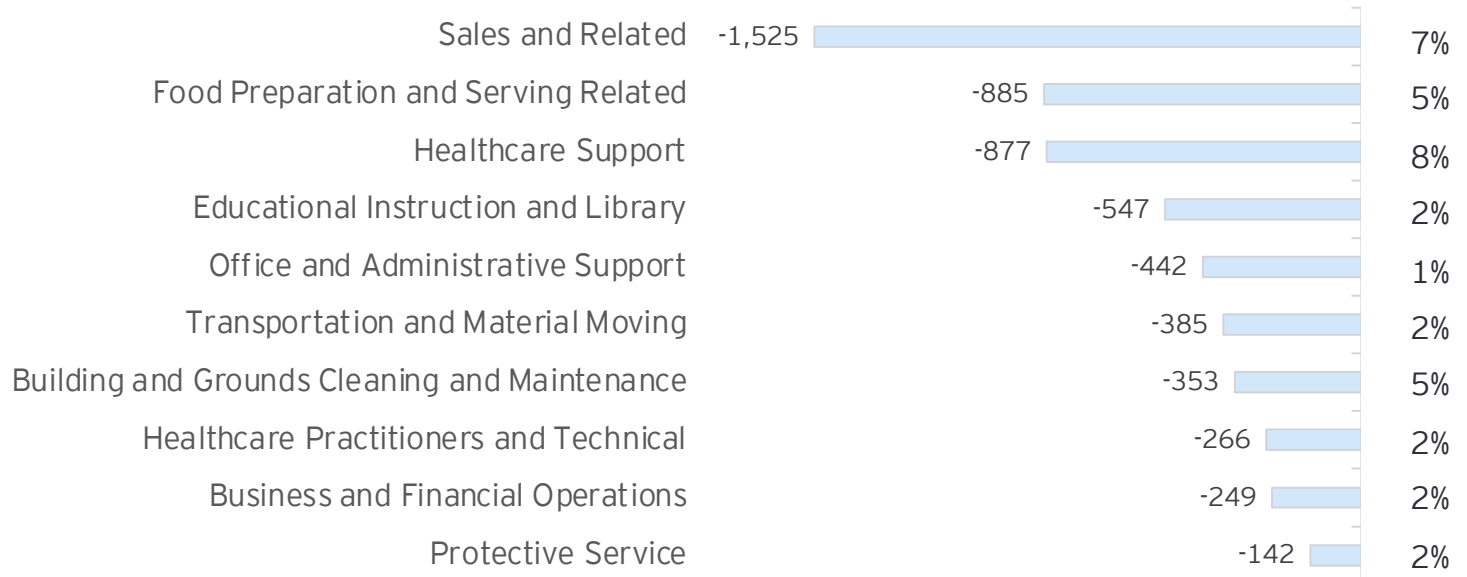
Occupation groups with the most net workers commuting INTO Western New York, 2021

Share of
Total Jobs



Occupation groups with most net workers commuting OUT OF Western New York, 2021

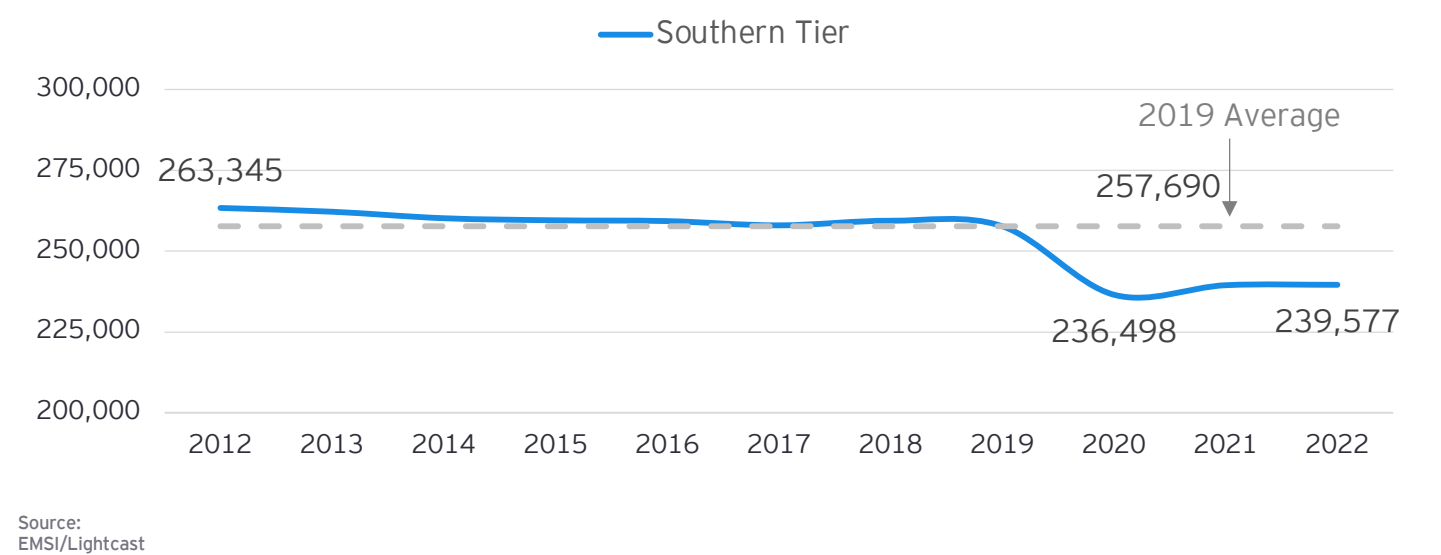
Share of
Total Jobs



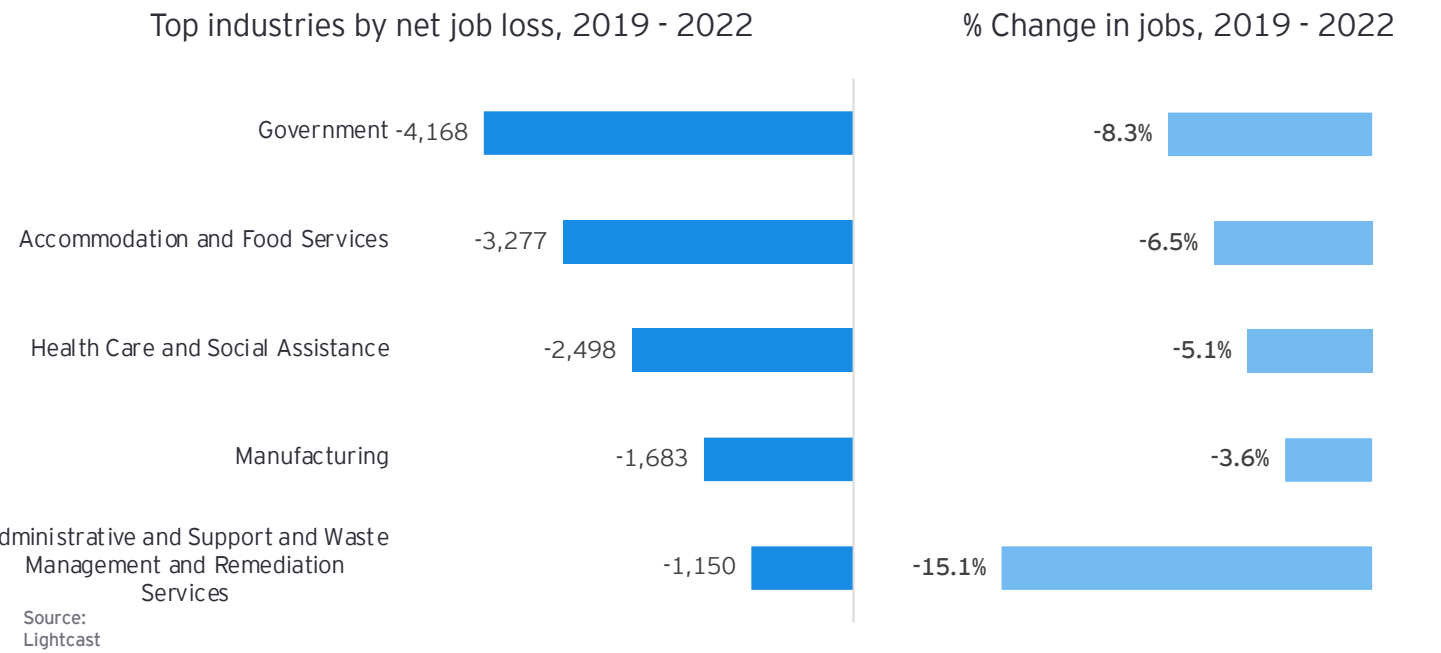
Source:
Lightcast


Wage & Salary employment in Southern Tier has rebounded in the last two years but is still 7% lower than pre-pandemic levels.

Wage & Salary employment by year, 2012 - 2022



Since the pandemic, Government, Accommodation/Restaurants, and Government lost the most jobs, but Administrative Support experienced the largest percentage decline.





Advanced Manufacturing: Industry and occupational analysis

About this chapter

Building off the research started during Phase I, we examine overall trends for each of the target sectors identified for the Southern Tier region. We also examine the specific make-up of each target sector's workforce by age, sex, educational attainment, and explore sector wages compared to other industries.

The analysis can help understand the larger economic trends impacting the sector and help to inform sector-specific stakeholder engagement throughout the project. Key metrics in this chapter include:

- ▶ Industry employment by year
- ▶ Number of businesses by year
- ▶ Employment snapshot by NAICS
- ▶ Business snapshot by NAICS
- ▶ Average annual earnings
- ▶ Industry workforce by sex
- ▶ Industry workforce by age

Key findings

- ▶ Advanced Manufacturing employment in Southern Tier has declined over the last ten years but levelled out at 17,400 during the pandemic.
- ▶ Over 200 Advanced Manufacturing businesses are in Southern Tier.
- ▶ Southern Tier has a large Computer/Electronic cluster but employment is falling. Railroad Rolling Stock has doubled employment to 1,700 in the past five years.
- ▶ Southern Tier worker earnings in Advanced Manufacturing are 30% above average overall, but two-thirds of jobs require only a high school diploma or less. The sector workforce in Southern Tier skews heavily toward males and slightly toward older workers.

Advanced Manufacturing

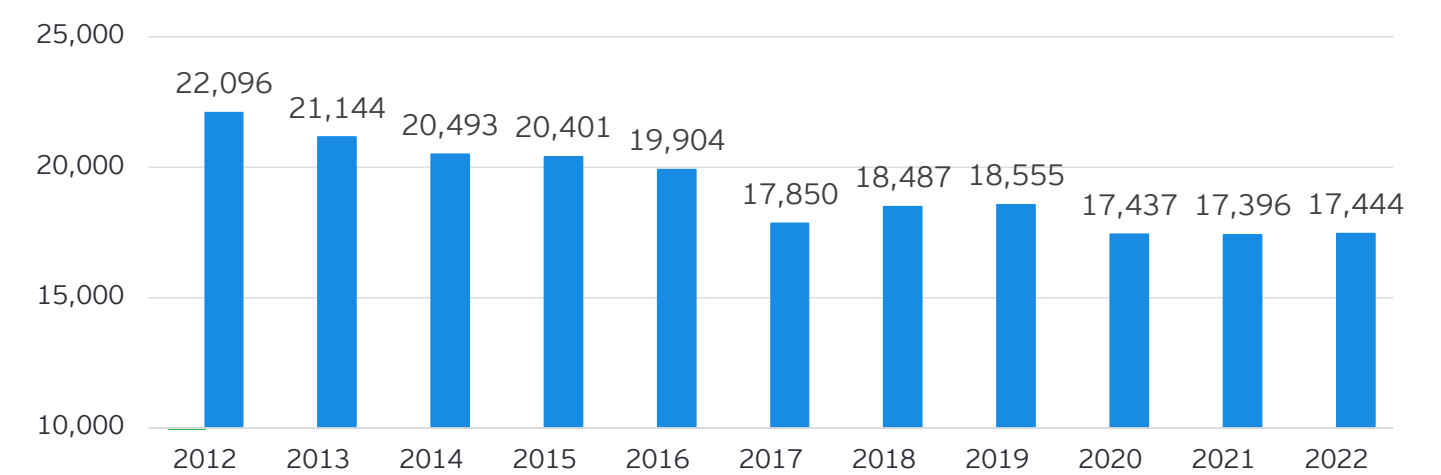
Cluster definitions for Advanced Manufacturing used as part of Phase II analysis for Southern Tier were provided to EY by the New York State Department of Labor and Empire State Development.

Advanced Manufacturing NAICS definition

NAICS Code	NAICS Description
3241	Petroleum and Coal Products Manufacturing
3251	Basic Chemical Manufacturing
3252	Resin, Synthetic Rubber, and Artificial and Synthetic Fibers and Filaments Manufacturing
3253	Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing
3254	Pharmaceutical and Medicine Manufacturing
3259	Other Chemical Product and Preparation Manufacturing
3271	Clay Product and Refractory Manufacturing
3279	Other Nonmetallic Mineral Product Manufacturing
3311	Iron and Steel Mills and Ferroalloy Manufacturing
3313	Alumina and Aluminum Production and Processing
3315	Foundries
3331	Agriculture, Construction, and Mining Machinery Manufacturing
3332	Industrial Machinery Manufacturing
3333	Commercial and Service Industry Machinery Manufacturing
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing
3339	Other General Purpose Machinery Manufacturing
3341	Computer and Peripheral Equipment Manufacturing
3342	Communications Equipment Manufacturing
3343	Audio and Video Equipment Manufacturing
3344	Semiconductor and Other Electronic Component Manufacturing
3345	Navigational, Measuring, Electromedical, and Control Instruments Manufacturing
3346	Manufacturing and Reproducing Magnetic and Optical Media
3351	Electric Lighting Equipment Manufacturing
3352	Household Appliance Manufacturing
3353	Electrical Equipment Manufacturing
3359	Other Electrical Equipment and Component Manufacturing
3361	Motor Vehicle Manufacturing
3362	Motor Vehicle Body and Trailer Manufacturing
3363	Motor Vehicle Parts Manufacturing
3364	Aerospace Product and Parts Manufacturing
3365	Railroad Rolling Stock Manufacturing
3366	Ship and Boat Building
3369	Other Transportation Equipment Manufacturing
3391	Medical Equipment and Supplies Manufacturing
3399	Other Miscellaneous Manufacturing

Advanced Manufacturing employment in Southern Tier has declined over the last ten years, with a slight uptick in 2018/2019. The pandemic has not impacted industry employment.

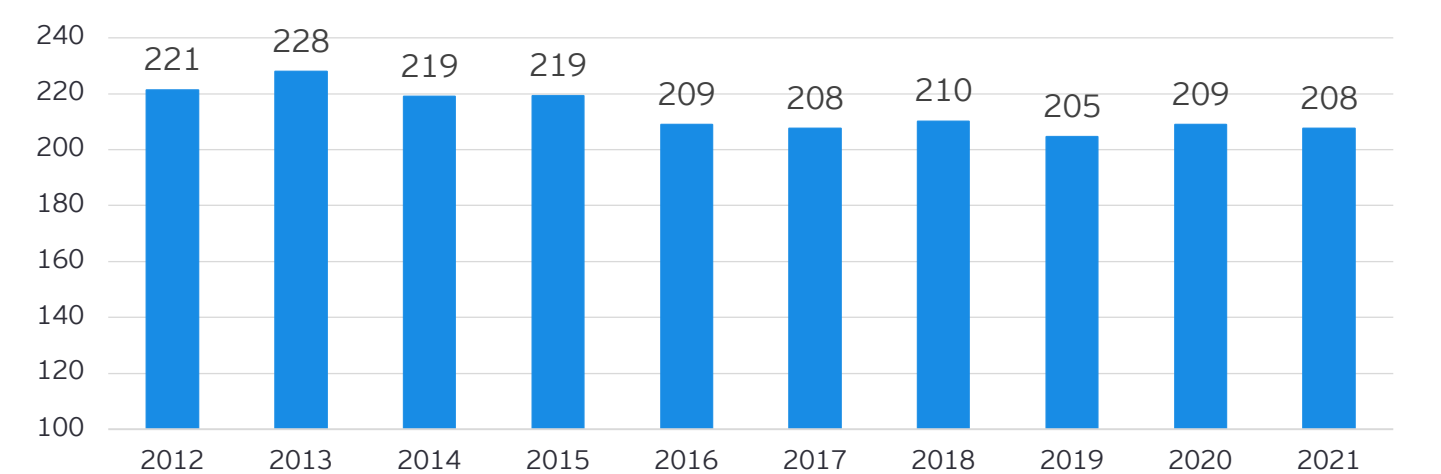
Advanced Manufacturing employment by year, 2012 - 2022



Source:
Lightcast

Over 200 Advanced Manufacturing businesses are found in Southern Tier today.

Number of payrolled business locations in Advanced Manufacturing, 2012 - 2021

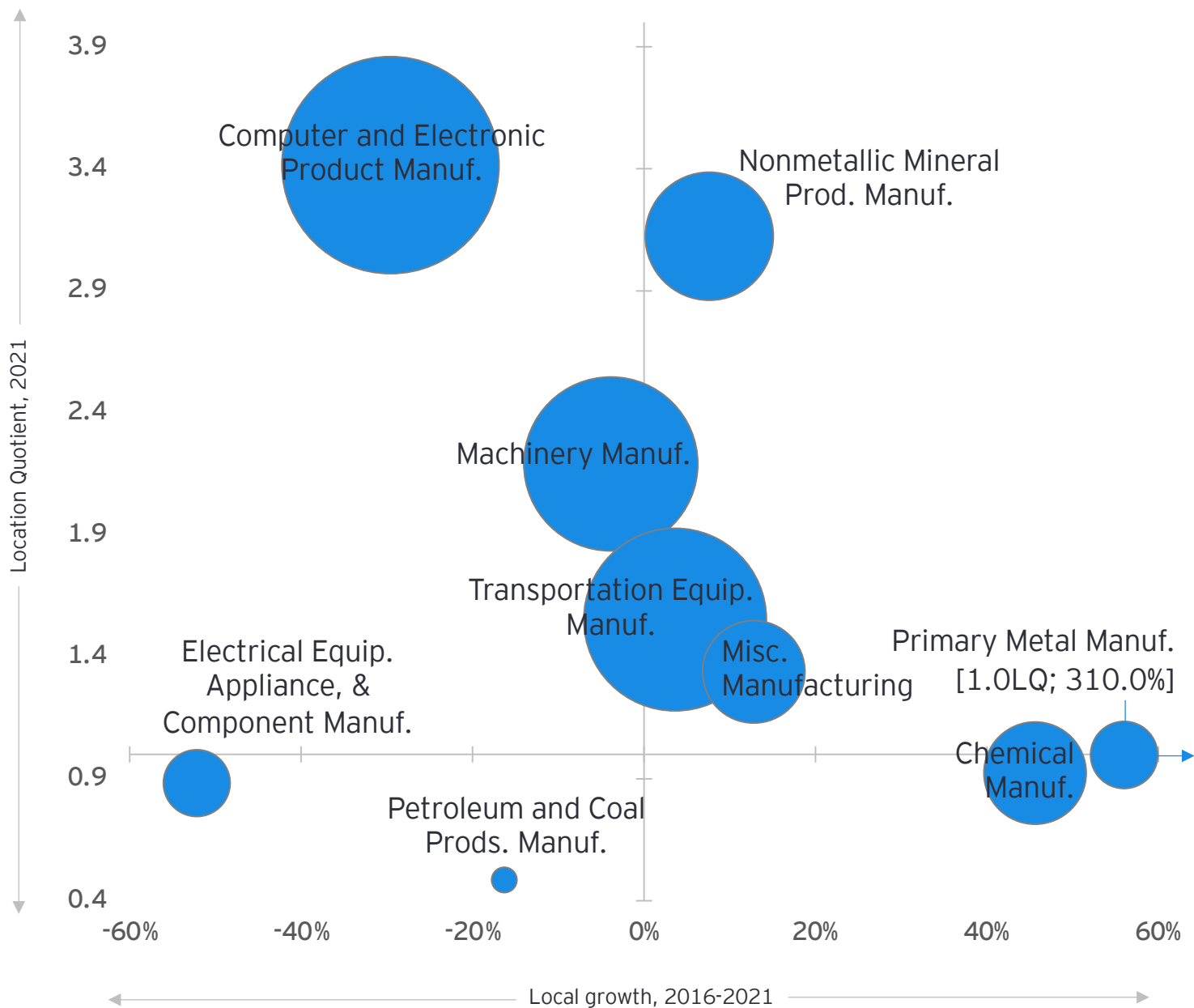


Source:
Lightcast

Advanced Manufacturing | Industry analysis

The fastest-growing Advanced Manufacturing subsectors in Southern Tier are Metals and Chemical Manufacturing. Transportation Equipment and Mineral Products are also growing. Southern Tier has a large Computer/Electronic cluster (including a per capita concentration 3.4 times the US average), but employment is falling.

Priority sector performance by jobs, 3-Digit Level NAICS, 2016 and 2021



Source: EMSI, New York State Department of Labor cluster definitions



Advanced Manufacturing | Industry analysis

Nearly 18,000 Advanced Manufacturing jobs are in Southern Tier. Semiconductor, Machinery, Instruments, Automotive Parts, and Rail Stock are the largest industries and reflect a diverse employment base. Semiconductor and Instruments have lost the most jobs, but new jobs are being created across numerous subsectors.

Southern Tier Region Advanced Manufacturing jobs insights, 2016 - 2021

NAICS Code	NAICS Description	No. of Jobs (2021)	Growth in No. of Jobs (2016-2021)	% Growth in No. of Jobs (2016-2021)
3344	Semiconductor and Other Electronic Component Manufacturing	2,567	-1,386	-35.1%
3339	Other General Purpose Machinery Manufacturing	2,274	-222	-8.9%
3345	Navigational, Measuring, Electromedical, and Control...	2,323	-1,172	-33.5%
3363	Motor Vehicle Parts Manufacturing	1,889	-391	-17.1%
3365	Railroad Rolling Stock Manufacturing	1,730	835	93.3%
3254	Pharmaceutical and Medicine Manufacturing	930	218	30.7%
3391	Medical Equipment and Supplies Manufacturing	848	16	1.9%
3341	Computer and Peripheral Equipment Manufacturing	656	-78	-10.6%
3359	Other Electrical Equipment and Component Manufacturing	479	225	88.6%
3399	Other Miscellaneous Manufacturing	492	136	38.3%
3342	Communications Equipment Manufacturing	372	144	63.4%
3315	Foundries	312	266	580.9%
3364	Aerospace Product and Parts Manufacturing	355	-233	-39.7%
3311	Iron and Steel Mills and Ferroalloy Manufacturing	267	267	--
3333	Commercial and Service Industry Machinery Manufacturing	257	37	17.0%
3336	Engine, Turbine, and Power Transmission Equip. Manufacturing	261	82	46.0%
3332	Industrial Machinery Manufacturing	252	-230	-47.7%
3271	Clay Product and Refractory Manufacturing	232	-142	-38.0%
3331	Agriculture, Construction, and Mining Machinery Manufacturing	141	52	59.2%
3362	Motor Vehicle Body and Trailer Manufacturing	144	-67	-31.6%
3369	Other Transportation Equipment Manufacturing	116	10	9.9%
3251	Basic Chemical Manufacturing	109	-1	-0.5%
3253	Pesticide, Fertilizer, and Other Ag. Chemical Manufacturing	87	75	645.5%
3353	Electrical Equipment Manufacturing	89	-590	-86.9%
3241	Petroleum and Coal Products Manufacturing	84	-16	-16.3%
3343	Audio and Video Equipment Manufacturing	65	-22	-25.2%
3279	Other Nonmetallic Mineral Product Manufacturing	55	-11	-16.4%
3351	Electric Lighting Equipment Manufacturing	0	-179	-100.0%
3259	Other Chemical Product and Preparation Man.	0	-17	-100.0%
3252	Resin, Synthetic Rubber, and Artificial and Synthetic Fibers...	0	-37	-100.0%
3352	Household Appliance Manufacturing	0	-84	-100.0%
Total jobs		17,736	-2,868	-13.9%

Source:
Lightcast

Advanced Manufacturing | Industry analysis

The number of Southern Tier companies in subsectors has been relatively stable over the past five years. Most new companies were created in Instruments (NAICS 3345).

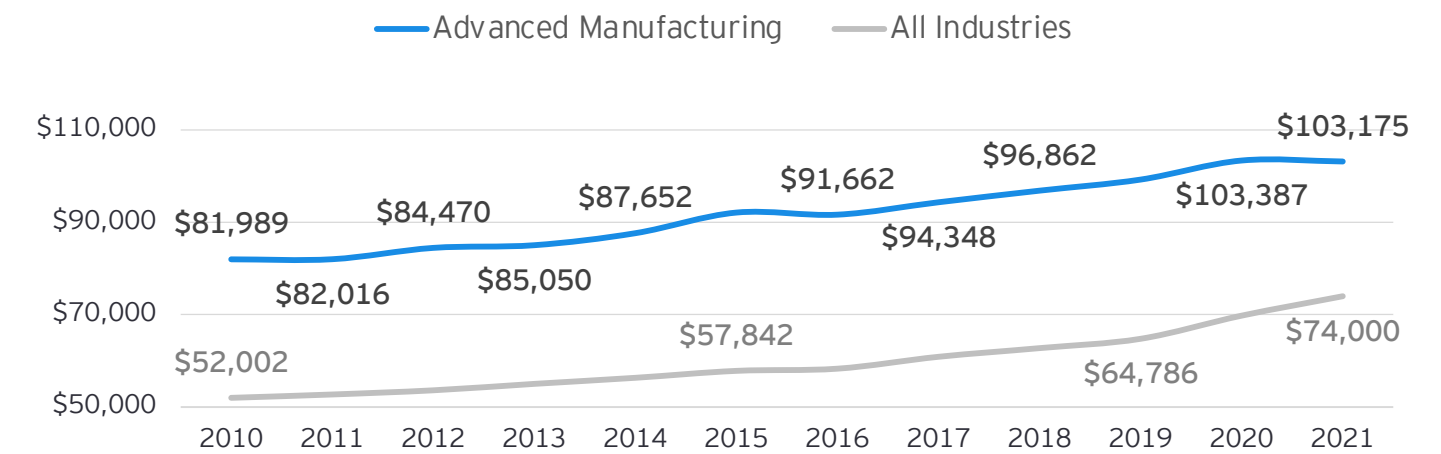
Southern Tier Region Advanced Manufacturing businesses, 2016 - 2021

NAICS Code	NAICS Description	No. of Businesses (2021)	Growth in No. of Businesses (2016-2021)	% Growth in No. of Businesses (2016-2021)
3344	Semiconductor and Other Electronic Component Manufacturing	26	-2	-6.3%
3399	Other Misc. Manufacturing	26	0	-1.0%
3345	Navigational, Measuring, Electromedical, and Control... Man.	25	6	32.9%
3391	Medical Equipment and Supplies Manufacturing	19	-1	-6.3%
3359	Other Electrical Equipment and Component Manufacturing	12	3	27.0%
3339	Other General Purpose Machinery Manufacturing	9	1	12.5%
3363	Motor Vehicle Parts Manufacturing	9	--	--
3365	Railroad Rolling Stock Manufacturing	8	3	60.0%
3241	Petroleum and Coal Products Manufacturing	7	-1	-12.5%
3332	Industrial Machinery Manufacturing	6	-1	-14.3%
3333	Commercial and Service Industry Machinery Manufacturing	5	1	25.0%
3341	Computer and Peripheral Equipment Manufacturing	5	--	--
3254	Pharmaceutical and Medicine Manufacturing	5	-1	-9.1%
3271	Clay Product and Refractory Manufacturing	5	-2	-28.6%
3251	Basic Chemical Manufacturing	5	3	125.0%
3279	Other Nonmetallic Mineral Product Manufacturing	4	--	--
3353	Electrical Equipment Manufacturing	4	--	--
3342	Communications Equipment Manufacturing	4	-1	-20.0%
3364	Aerospace Product and Parts Manufacturing	4	-2	-33.3%
3315	Foundries	4	1	25.0%
3336	Engine, Turbine, and Power Transmission Equip. Manufacturing	3	-1	-25.0%
3362	Motor Vehicle Body and Trailer Manufacturing	3	-1	-29.4%
3253	Pesticide, Fertilizer, and Other Ag. Chemical Manufacturing	2	1	100.0%
3369	Other Transportation Equipment Manufacturing	2	1	100.0%
3343	Audio and Video Equipment Manufacturing	2	--	--
3311	Iron and Steel Mills and Ferroalloy Manufacturing	1	1	--
3351	Electric Lighting Equipment Manufacturing	1	-1	-50.0%
3259	Other Chemical Product and Preparation Manufacturing	1	-1	-50.0%
3331	Agriculture, Construction, and Mining Machinery Manufacturing	1	-3	-73.3%
3352	Household Appliance Manufacturing	--	-1	-75.0%
3252	Resin, Synth. Rubber, & Artificial & Synth. Fibers & Filaments...	--	-1	-100.0%
3361	Motor Vehicle Manufacturing	--	-2	-100.0%
Total number of payrolled business locations		208	-2	-0.7%

Source:
Lightcast

Southern Tier worker earnings in Advanced Manufacturing are over \$100,000 and are much higher than the average of all industries.

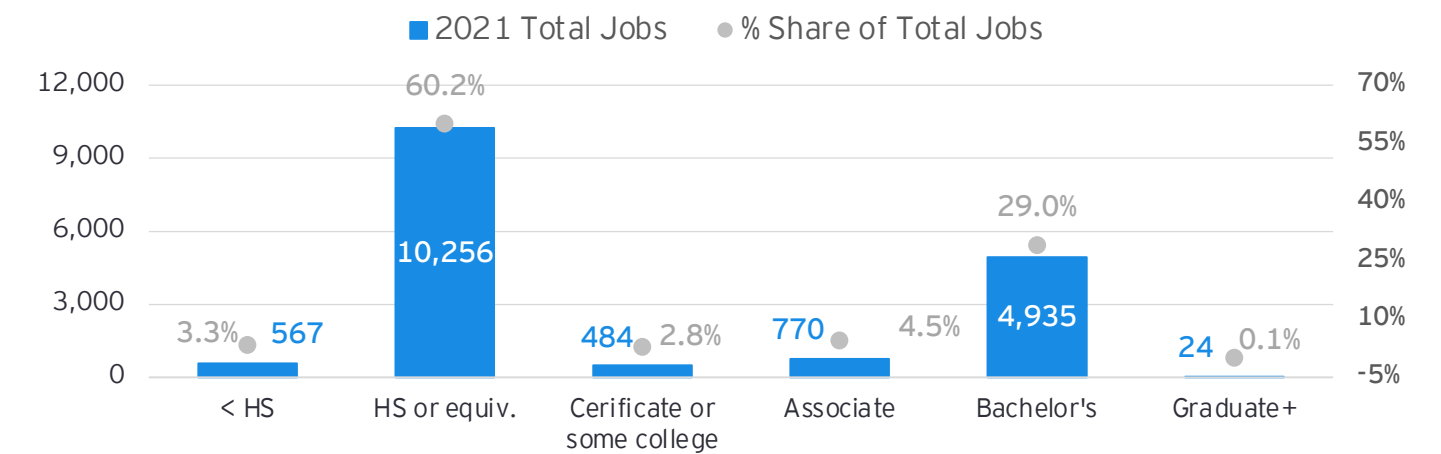
Average annual earnings, 2010 - 2021



Source:
EMSI

Nearly 30% of all Advanced Manufacturing jobs in Southern Tier require a bachelor's degree or higher. Still, two-thirds of jobs require a high school diploma or less.

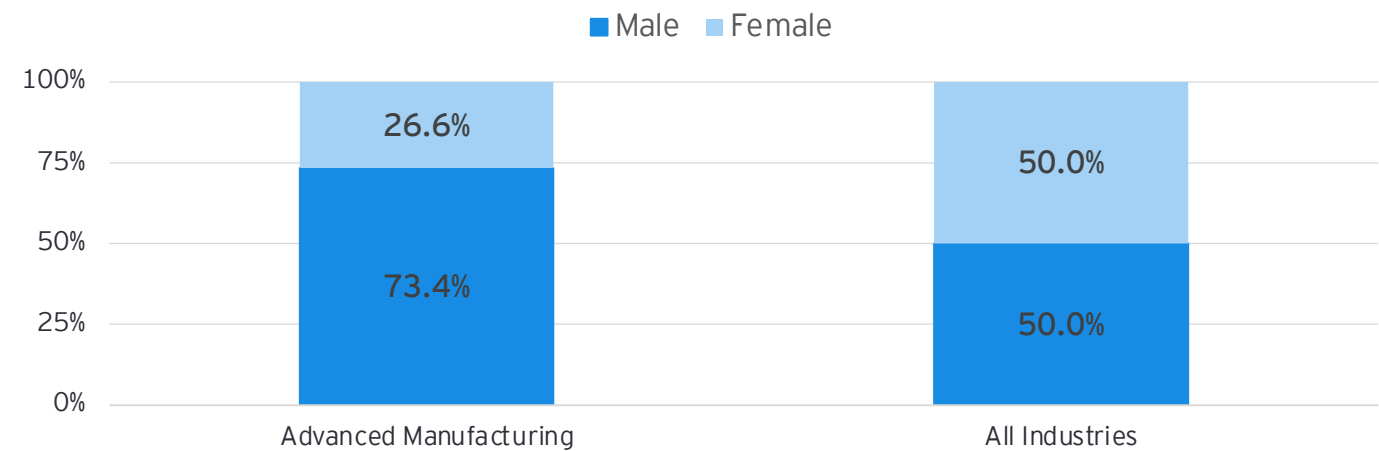
Total jobs by typical entry-level education requirement, in Advanced Manufacturing, 2021



Source:
EMSI

Male workers in Southern Tier account for nearly three-quarters of Advanced Manufacturing workers. Males account for half of workers in all industries.

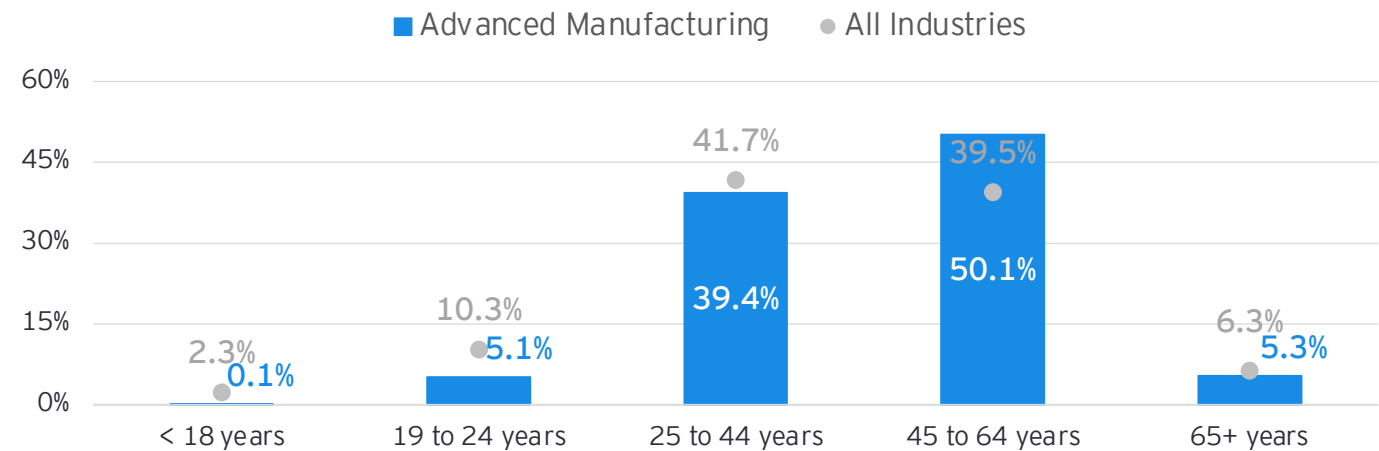
Employment within sector, by sex, 2021



Source:
EMSI

Older workers (45+) comprise a much higher share of the Advanced Manufacturing workforce in Southern Tier, which could signal more retirements of workers in coming years.

Employment within sector, by age, 2021



Source:
US Bureau of Labor Statistics

Advanced Manufacturing | Occupational analysis

A large number of Southern Tier workers in Advanced Manufacturing are in general assembly, electrical assembly, inspectors, and clerks. Bachelor's level demand is highest for Industrial Engineers and Software Developers. Few jobs require an associate degree.

Top 25 Advanced Manufacturing occupations with entry-level educational requirements and median hourly earnings, 2021

SOC Code	SOC Description	No. of Jobs (2021)	Median Hourly Earnings (2021)	Typical Entry Level Edu. Req. (2021)
51-2098	Miscellaneous Assemblers and Fabricators	1,454	\$16.32	HS diploma or equiv.
51-2028	Electrical, Electronic, and Electromechanical...	1,311	\$15.10	HS diploma or equiv.
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	625	\$20.19	HS diploma or equiv.
43-5061	Production, Planning, and Expediting Clerks	604	\$24.45	HS diploma or equiv.
17-2112	Industrial Engineers	598	\$39.57	Bachelor's degree
51-1011	First-Line Supervisors of Prod. and Operating Workers	563	\$31.26	HS diploma or equiv.
51-4041	Machinists	550	\$22.66	HS diploma or equiv.
15-1252	Software Developers	448	\$48.27	Bachelor's degree
11-1021	General and Operations Managers	415	\$43.68	Bachelor's degree
51-4121	Welders, Cutters, Solderers, and Brazers	399	\$19.26	HS diploma or equiv.
51-4081	Multiple Machine Tool Setters, Operators, and Tenders...	359	\$22.52	HS diploma or equiv.
49-9071	Maintenance and Repair Workers, General	334	\$19.62	HS diploma or equiv.
17-2141	Mechanical Engineers	326	\$40.07	Bachelor's degree
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	319	\$15.47	No formal education
41-4012	Sales Reps, Wholesale and Man., Except Technical...	285	\$29.17	HS diploma or equiv.
17-3026	Industrial Engineering Technologists and Technicians	277	\$28.25	Associate degree
13-1028	Buyers and Purchasing Agents	259	\$31.02	Bachelor's degree
43-5071	Shipping, Receiving, and Inventory Clerks	237	\$17.79	HS diploma or equiv.
51-9141	Semiconductor Processing Technicians	221	\$19.49	HS diploma or equiv.
51-9111	Packaging and Filling Machine Operators and Tenders	211	\$15.16	HS diploma or equiv.
17-2071	Electrical Engineers	208	\$46.61	Bachelor's degree
17-3023	Electrical and Electronic Engineering Technologists...	205	\$24.23	Associate degree
13-2011	Accountants and Auditors	201	\$36.45	Bachelor's degree
49-9041	Industrial Machinery Mechanics	197	\$28.31	HS diploma or equiv.
43-4051	Customer Service Representatives	189	\$18.77	HS diploma or equiv.
Total jobs in top 25 occupations		10,795	\$26.95	

Source:
US Bureau of Labor Statistics

Advanced Manufacturing | Occupational analysis

For those with a high school diploma or equivalent, most Southern Tier jobs in Advanced Manufacturing are in assembly, inspection, clerks, supervisors, machinists, and welders.

Top 25 Advanced Manufacturing occupations with entry-level educational requirements of high school diploma or less with median hourly earnings, 2021

SOC Code	SOC Description	No. of Jobs (2021)	Median Hourly Earnings (2021)	Typical Entry Level Edu. Req. (2021)
51-2098	Misc. Assemblers and Fabricators	1,454	\$16.32	HS diploma or equiv.
51-2028	Electrical, Electronic, and Electromechanical...	1,311	\$15.10	HS diploma or equiv.
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	625	\$20.19	HS diploma or equiv.
43-5061	Production, Planning, and Expediting Clerks	604	\$24.45	HS diploma or equiv.
51-1011	First-Line Supervisors of Prod. & Operating Workers	563	\$31.26	HS diploma or equiv.
51-4041	Machinists	550	\$22.66	HS diploma or equiv.
51-4121	Welders, Cutters, Solderers, and Brazers	399	\$19.26	HS diploma or equiv.
51-4081	Multiple Machine Tool Setters, Operators, and Tenders...	359	\$22.52	HS diploma or equiv.
49-9071	Maintenance and Repair Workers, General	334	\$19.62	HS diploma or equiv.
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	319	\$15.47	No formal education
41-4012	Sales Reps., Wholesale & Man., Except Technical...	285	\$29.17	HS diploma or equiv.
43-5071	Shipping, Receiving, and Inventory Clerks	237	\$17.79	HS diploma or equiv.
51-9141	Semiconductor Processing Technicians	221	\$19.49	HS diploma or equiv.
51-9111	Packaging and Filling Machine Operators and Tenders	211	\$15.16	HS diploma or equiv.
49-9041	Industrial Machinery Mechanics	197	\$28.31	HS diploma or equiv.
43-4051	Customer Service Representatives	189	\$18.77	HS diploma or equiv.
51-9161	Computer Numerically Controlled Tool Operators	168	\$21.37	HS diploma or equiv.
43-6014	Secretaries and Admin. Assists., Except Legal, Medical...	160	\$19.19	HS diploma or equiv.
51-9011	Chemical Equipment Operators and Tenders	145	\$25.70	HS diploma or equiv.
43-9061	Office Clerks, General	137	\$16.51	HS diploma or equiv.
51-2031	Engine and Other Machine Assemblers	128	\$23.22	HS diploma or equiv.
51-4072	Molding, Coremaking, & Casting Machine Setters, Op...	125	\$15.48	HS diploma or equiv.
51-4031	Cutting, Punching, and Press Machine Setters, Op...	125	\$17.88	HS diploma or equiv.
49-3043	Rail Car Repairers	101	\$33.69	HS diploma or equiv.
51-4122	Welding, Soldering, and Brazing Machine Setters,...	100	\$18.37	HS diploma or equiv.
Total jobs in top 25 occupations		9,047	\$21.08	

Source:
US Bureau of Labor Statistics

Advanced Manufacturing | Occupational analysis

Of the positions requiring some college or an associate degree, most Southern Tier jobs in Advanced Manufacturing are for industrial and electrical technicians, bookkeepers, mechanical drafter, computer support, and truck drivers.

Top 25 Advanced Manufacturing (4-Digit NAICS) occupations with mid-level educational requirements of certificate through associate degree with median hourly earnings, 2021

SOC Code	SOC Description	No. of Jobs (2021)	Median Hourly Earnings (2021)	Typical Entry Level Edu. Req. (2021)
17-3026	Industrial Engineering Technologists and Technicians	277	\$28.25	Associate degree
17-3023	Electrical and Electronic Engineering Technologists...	205	\$24.23	Associate degree
43-3031	Bookkeeping, Accounting, and Auditing Clerks	159	\$18.98	Some college
17-3013	Mechanical Drafters	79	\$27.36	Associate degree
15-1232	Computer User Support Specialists	77	\$25.10	Some college
53-3032	Heavy and Tractor-Trailer Truck Drivers	76	\$22.63	Postsec. Nondegree
51-4111	Tool and Die Makers	71	\$24.70	Postsec. Nondegree
17-3027	Mechanical Engineering Technologists and Technicians	58	\$29.86	Associate degree
17-3029	Engineering Technologists and Technicians, Except...	57	\$23.74	Associate degree
19-4031	Chemical Technicians	35	\$26.54	Associate degree
49-2094	Electrical & Electronics Repairers, Comm. & Ind. Equip.	34	\$25.94	Postsec. Nondegree
51-9162	Computer Numerically Controlled Tool Programmers	27	\$29.25	Postsec. Nondegree
15-1231	Computer Network Support Specialists	25	\$26.97	Associate degree
17-3012	Electrical and Electronics Drafters	22	\$26.07	Associate degree
49-9021	Heating, AC, and Refrigeration Mechanics and Installers	17	\$26.44	Postsec. Nondegree
49-3011	Aircraft Mechanics and Service Technicians	13	\$33.76	Postsec. Nondegree
43-4161	HR Assistants, Except Payroll and Timekeeping	11	\$23.17	Associate degree
49-2093	Electrical and Electronics Installers and Repairers,...	10	\$34.11	Postsec. Nondegree
49-9062	Medical Equipment Repairers	<10	\$25.67	Associate degree
43-4151	Order Clerks	<10	\$16.65	Some college
49-2011	Computer, Automated Teller, and Office Machine...	<10	\$21.46	Some college
49-3023	Automotive Service Technicians and Mechanics	<10	\$20.78	Postsec. Nondegree
31-9092	Medical Assistants	<10	\$15.32	Postsec. Nondegree
17-3019	Drafters, All Other	<10	\$31.98	Associate degree
17-3011	Architectural and Civil Drafters	<10	\$25.38	Associate degree
Total jobs in top 25 occupations		1,254	\$25.37	

Source:
Lightcast

Advanced Manufacturing | Occupational analysis

For positions requiring a bachelor's degree, most Southern Tier jobs in Advanced Manufacturing are for Industrial Engineers, Software Developers, Operations Managers and Mechanical Engineers.

Top 25 Advanced Manufacturing (4-Digit NAICS) occupations with high-level educational requirements of bachelor's and above with median hourly earnings, 2021

SOC Code	SOC Description	No. of Jobs (2021)	Median Hourly Earnings (2021)	Typical Entry Level Edu. Req. (2021)
17-2112	Industrial Engineers	598	\$39.57	Bachelor's degree
15-1252	Software Developers	448	\$48.27	Bachelor's degree
11-1021	General and Operations Managers	415	\$43.68	Bachelor's degree
17-2141	Mechanical Engineers	326	\$40.07	Bachelor's degree
13-1028	Buyers and Purchasing Agents	259	\$31.02	Bachelor's degree
17-2071	Electrical Engineers	208	\$46.61	Bachelor's degree
13-2011	Accountants and Auditors	201	\$36.45	Bachelor's degree
11-3051	Industrial Production Managers	176	\$53.26	Bachelor's degree
17-2199	Engineers, All Other	158	\$46.33	Bachelor's degree
11-9041	Architectural and Engineering Managers	142	\$73.45	Bachelor's degree
41-4011	Sales Rep, Wholesale and Manufacturing, Technical...	135	\$47.23	Bachelor's degree
13-1082	Project Management Specialists	127	\$43.97	Bachelor's degree
13-1161	Market Research Analysts and Marketing Specialists	115	\$31.37	Bachelor's degree
13-1071	Human Resources Specialists	101	\$31.75	Bachelor's degree
17-2072	Electronics Engineers, Except Computer	87	\$44.54	Bachelor's degree
15-1244	Network and Computer Systems Administrators	83	\$41.23	Bachelor's degree
11-3021	Computer and Information Systems Managers	73	\$71.77	Bachelor's degree
15-1211	Computer Systems Analysts	71	\$43.54	Bachelor's degree
11-2022	Sales Managers	67	\$62.00	Bachelor's degree
17-2061	Computer Hardware Engineers	66	\$62.87	Bachelor's degree
11-3031	Financial Managers	66	\$64.22	Bachelor's degree
13-2051	Financial and Investment Analysts	66	\$39.42	Bachelor's degree
15-1253	Software Quality Assurance Analysts and Testers	64	\$40.24	Bachelor's degree
19-2031	Chemists	61	\$26.89	Bachelor's degree
13-1199	Business Operations Specialists, All Other	59	\$33.26	Bachelor's degree
Total jobs in top 25 occupations		4,174	\$45.72	

Source:
Lightcast

Advanced Manufacturing | Occupational analysis

For positions requiring a bachelor's degree, most Southern Tier jobs in Advanced Manufacturing are for Industrial Engineers, Software Developers, Operations Managers and Mechanical Engineers.

Top 25 Advanced Manufacturing (4-Digit NAICS) occupations with high-level educational requirements of bachelor's and above with median hourly earnings, 2021

SOC Code	SOC Description	No. of Jobs (2021)	Median Hourly Earnings (2021)	Typical Entry Level Edu. Req. (2021)
17-2112	Industrial Engineers	598	\$39.57	Bachelor's degree
15-1252	Software Developers	448	\$48.27	Bachelor's degree
11-1021	General and Operations Managers	415	\$43.68	Bachelor's degree
17-2141	Mechanical Engineers	326	\$40.07	Bachelor's degree
13-1028	Buyers and Purchasing Agents	259	\$31.02	Bachelor's degree
17-2071	Electrical Engineers	208	\$46.61	Bachelor's degree
13-2011	Accountants and Auditors	201	\$36.45	Bachelor's degree
11-3051	Industrial Production Managers	176	\$53.26	Bachelor's degree
17-2199	Engineers, All Other	158	\$46.33	Bachelor's degree
11-9041	Architectural and Engineering Managers	142	\$73.45	Bachelor's degree
41-4011	Sales Rep, Wholesale and Manufacturing, Technical...	135	\$47.23	Bachelor's degree
13-1082	Project Management Specialists	127	\$43.97	Bachelor's degree
13-1161	Market Research Analysts and Marketing Specialists	115	\$31.37	Bachelor's degree
13-1071	Human Resources Specialists	101	\$31.75	Bachelor's degree
17-2072	Electronics Engineers, Except Computer	87	\$44.54	Bachelor's degree
15-1244	Network and Computer Systems Administrators	83	\$41.23	Bachelor's degree
11-3021	Computer and Information Systems Managers	73	\$71.77	Bachelor's degree
15-1211	Computer Systems Analysts	71	\$43.54	Bachelor's degree
11-2022	Sales Managers	67	\$62.00	Bachelor's degree
17-2061	Computer Hardware Engineers	66	\$62.87	Bachelor's degree
11-3031	Financial Managers	66	\$64.22	Bachelor's degree
13-2051	Financial and Investment Analysts	66	\$39.42	Bachelor's degree
15-1253	Software Quality Assurance Analysts and Testers	64	\$40.24	Bachelor's degree
19-2031	Chemists	61	\$26.89	Bachelor's degree
13-1199	Business Operations Specialists, All Other	59	\$33.26	Bachelor's degree
Total jobs in top 25 occupations		4,174	\$45.72	

Source:
Lightcast

Advanced Manufacturing | Workforce Gap Analysis

Advanced Manufacturing firms, as shown in tables in the previous pages, require diverse occupations and skill levels to fill jobs in their facilities. The gap analysis below shows that Southern Tier significantly underproduces (accredited) Certificate-level graduates in Advanced Manufacturing and overproduces most Bachelor's graduates, many of whom can be expected to leave the region after graduation.

The table below shows occupation groups that are matched to degree programs to determine if the supply of graduates is sufficient to meet demand (measured as job openings in a year). A US comparison helps clarify if there is a gap or overproduction of graduates by comparing regional graduates to jobs with the US ratio of graduates to jobs (as shown in the right column below).

Certificate-level positions (at accredited institutions, not including non-profits) are significantly underserved by local programs, which may suggest manufacturers are reliant on for-profit educators or on-the-job training. **Welding** has the largest production of graduates (33) and a handful of Machinist graduates. **Industrial Production Technicians** and **Industrial Machinery Maintenance** have zero graduates.

At the Associate's level, **Industrial Engineering Technicians** are underproduced in the region, but **Electrical/Electronic Technicians** appear to produce enough graduates, as many workers learn their skills on-the-job. Bachelor's level positions are well-served, as the region overproduces graduates across several **Engineering**, **Accounting**, and **Software/IT** programs, suggesting many graduates leave the region upon graduation.

Supply-Demand Gap Conditions

Advanced Manufacturing, Southern Tier

Gap	Occupation Group	Avg. Educ. Level	Regional 2021 Job Openings	Graduates	Regional Ratio	Supply-demand Ratio versus US
Lg Shortage	General Machinist	Certificate	206	5	2%	22%
	Industrial Production Technicians	Certificate	133	0	0%	0%
	Industrial Machinery Maintenance	Certificate	92	0	0%	0%
	Welders	Certificate	108	33	31%	39%
Shortage	Electrical / Electronics Technicians & Di	Associate's	45	28	62%	229%
	Industrial Engineering Technicians	Associate's	59	27	46%	49%
Over-Supply	Accountants & Tax Examiners	Bachelor's	171	318	186%	384%
	Electrical and Electronics Engineers	Bachelor's	44	368	841%	671%
	Engineering Managers	Bachelor's	24	13	54%	105%
	Industrial Engineers	Bachelor's	70	192	275%	374%
	Mechanical Engineers	Bachelor's	70	505	718%	421%
	Software Developers	Bachelor's	183	1,054	575%	1815%
	Computer Systems & Information Securi	Bachelor's	98	438	446%	492%

Lg Shortage Shortage In-Balance Over-Supply Lg Over-Supply

Source:
EY analysis of data from Lightcast and US Dept. of Education

More on the Methodology

“Job openings” in 2021 is used to determine demand, which is a combination of workforce turnover and retirement as well as net new jobs. Regional job openings are compared to regional graduate output using an SOC-CIP taxonomy that accounts for education levels. (For example, a Bachelor’s in Psychology is not matched with a Psychologist occupation because a Master’s or PhD is required.)

Furthermore, the “supply-demand gap” doesn’t hold true as a 1:1 ratio for all occupations. Therefore, we compare the regional ratio to the US ratio to determine if regional graduate output is relatively high or low. This Regional-to-US ratio also compensates for “non-accredited” programs that may exist but aren’t in the data (e.g. for-profits that aren’t required to report their enrollment data to the government). For example, non-profits may train Home Health Aides which aren’t in the data, but the regional comparison of “accredited” graduates to the US does help inform if a local gap may exist.

We determine the regional gap or oversupply in the right column (“ratio vs. US”). If regional graduate output is less than 50% of the US ratio, then we determine there is a large shortage and color the first “Gap” column a dark red. See the legend for colors and their ranges below.

Why does graduate output not always match job openings evenly? Graduates sometimes choose other occupations: Welding may need more graduates since many may finish the program and then choose other jobs, or an Electrical Engineering graduate with a minor in Business may choose a sales but not engineering job. Some positions, like Executive Secretaries or Logistics Clerks are helped by Certificates but many workers learn their skill on the job.

Data is sourced from US Dept. of Education’s IPEDS programs (graduate output) and Lightcast/EMSI (job openings by occupation by county). We use a custom taxonomy allocates 1,000 occupation codes and 10,000 graduate program codes (CIP+AwardLevel combinations) into 310 occupation groups. Some degree programs aren’t matched if they don’t align with jobs in the SOC system or if more education is needed to enter the occupation.

Gap Legend and Ratio Ranges:

High Shortage	Shortage	In Balance	Over-Supply	Large Over-Supply
Less than 50% of US Ratio	50% up to 80%	80% up to 120% (About even w/US)	120% up to 200%	200% or higher than US Ratio





4 Agribusiness: Industry and occupational analysis

About this chapter

Building off the research started during Phase I, we examine overall trends for each of the target sectors identified for the Southern Tier region. We also examine the specific make-up of each target sector's workforce by age, sex, educational attainment, and explore sector wages compared to other industries.

The analysis can help explain the larger economic trends impacting the sector and help to inform sector-specific stakeholder engagement throughout the project. Key metrics in this chapter include:

- ▶ Industry employment by year
- ▶ Number of businesses by year
- ▶ Employment snapshot by NAICS
- ▶ Business snapshot by NAICS
- ▶ Average annual earnings
- ▶ Industry workforce by sex
- ▶ Industry workforce by age

Key findings

- ▶ The number of Southern Tier employees in Agribusiness has been slowly growing, reaching nearly 6,000 workers.
- ▶ Animal and Crop Production account for the majority of Agribusinesses in the region, but 60 wineries and breweries are also present.
- ▶ Few jobs in Southern Tier's Agribusiness sector require more than a high school diploma, and wage levels are slightly below-average.
- ▶ The sector workforce skews toward males and early career ages.

Cluster definitions for Agribusiness used as part of Phase II analysis for Southern Tier were provided to EY by the New York State Department of Labor and Empire State Development.

Agribusiness NAICS definition

NAICS Code	NAICS Description
111000	Crop Production
112000	Animal Production
311111	Dog and Cat Food Manufacturing
311119	Other Animal Food Manufacturing
311211	Flour Milling
311212	Rice Milling
311213	Malt Manufacturing
311221	Wet Corn Milling
311224	Soybean and Other Oilseed Processing
311225	Fats and Oils Refining and Blending
311230	Breakfast Cereal Manufacturing
311313	Beet Sugar Manufacturing
311314	Cane Sugar Manufacturing
311340	Nonchocolate Confectionery Manufacturing
311351	Chocolate and Confectionery Manufacturing from Cacao Beans
311352	Confectionery Manufacturing from Purchased Chocolate
311411	Frozen Fruit, Juice, and Vegetable Manufacturing
311412	Frozen Specialty Food Manufacturing
311421	Fruit and Vegetable Canning
311422	Specialty Canning
311423	Dried and Dehydrated Food Manufacturing
311511	Fluid Milk Manufacturing
311512	Creamery Butter Manufacturing
311513	Cheese Manufacturing
311514	Dry, Condensed, and Evaporated Dairy Product Manufacturing
311520	Ice Cream and Frozen Dessert Manufacturing
311611	Animal (except Poultry) Slaughtering
311612	Meat Processed from Carcasses
311613	Rendering and Meat Byproduct Processing
311615	Poultry Processing
311710	Seafood Product Preparation and Packaging
311811	Retail Bakeries
311812	Commercial Bakeries
311813	Frozen Cakes, Pies, and Other Pastries Manufacturing
311821	Cookie and Cracker Manufacturing
311824	Dry Pasta, Dough, and Flour Mixes Manufacturing from Purchased Flour
311830	Tortilla Manufacturing

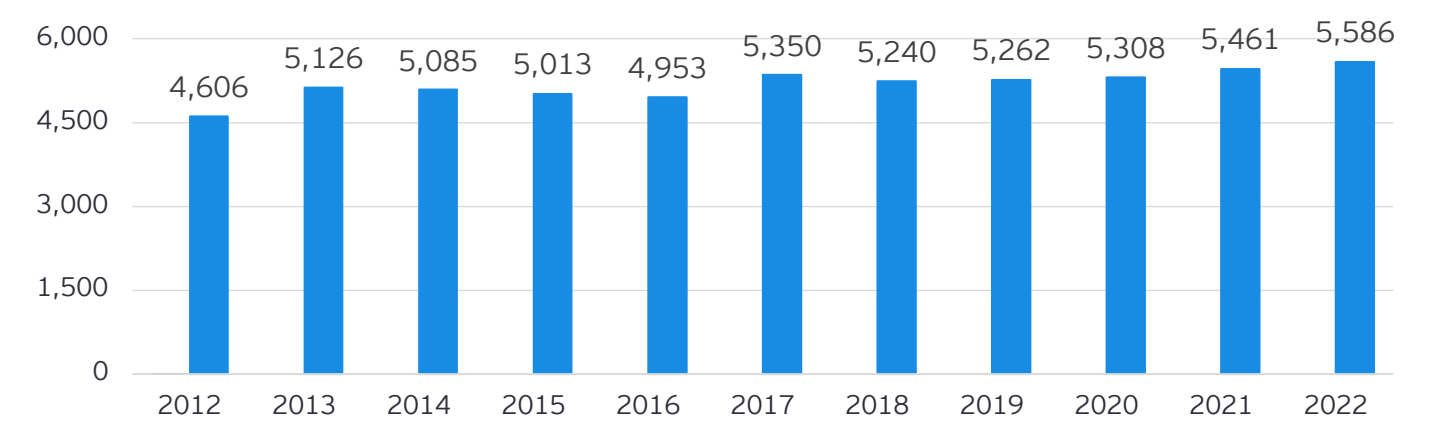
Cluster definitions for Agribusiness used as part of Phase II analysis for Southern Tier were provided to EY by the New York State Department of Labor and Empire State Development.

Agribusiness NAICS definition, *continued...*

NAICS Code	NAICS Description
311911	Roasted Nuts and Peanut Butter Manufacturing
311919	Other Snack Food Manufacturing
311920	Coffee and Tea Manufacturing
311930	Flavoring Syrup and Concentrate Manufacturing
311941	Mayonnaise, Dressing, and Other Prepared Sauce Manufacturing
311942	Spice and Extract Manufacturing
311991	Perishable Prepared Food Manufacturing
311999	All Other Miscellaneous Food Manufacturing
312111	Soft Drink Manufacturing
312112	Bottled Water Manufacturing
312113	Ice Manufacturing
312120	Breweries
312130	Wineries
312140	Distilleries

The number of Southern Tier employees in Agribusiness has been slowly growing, reaching nearly 6,000 workers.

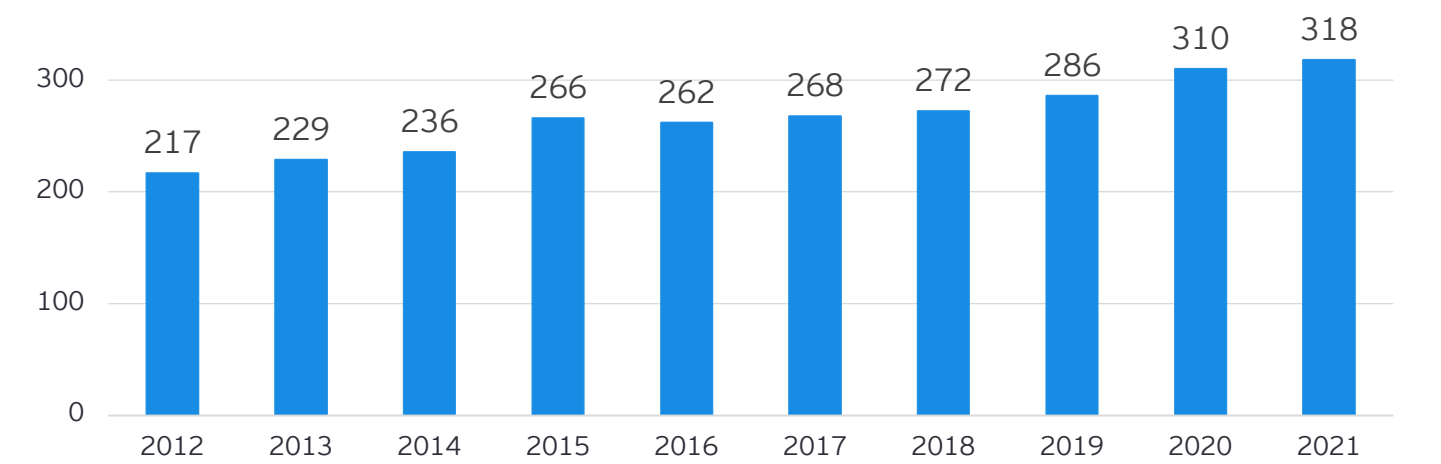
Agribusiness employment by year, 2012 - 2022



Source:
Lightcast

Since 2018, the number of Agribusinesses in Southern Tier locations has grown, reaching over 300 firms.

Number of payrolled business locations in Agribusiness, 2012 - 2021

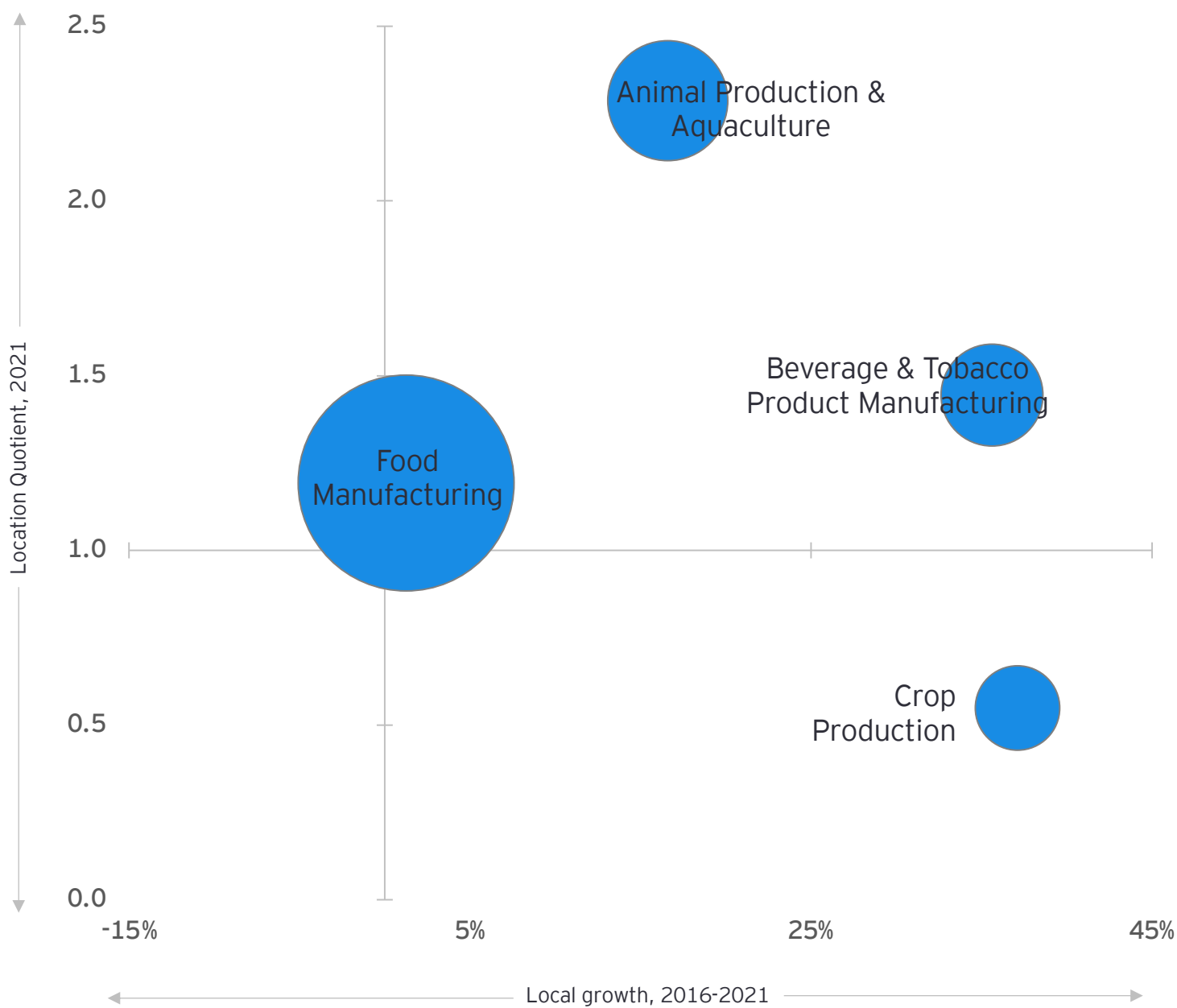


Source:
Lightcast

Agribusiness | Industry analysis

The fastest-growing Agribusiness subsectors in Southern Tier are Beverage Manufacturing and Crop Production. The region's largest subsector, Food Manufacturing, grew only slightly in the last five years. Animal Production has a high per capita concentration relative to the US.

Priority sector performance by jobs, 3-Digit Level NAICS, 2016 and 2021



Source: EMSI, New York State Department of Labor cluster definitions

Fluid Milk Production and Animal Production account for about half of Agribusiness jobs in Southern Tier. Crop Production, snack food and wineries are top sectors as well.

Southern Tier Region Agribusiness jobs, 2016 - 2021

NAICS Code	NAICS Description	No. of Jobs (2021)	Growth in No. of Jobs (2016-2021)	% Growth in No. of Jobs (2016-2021)
311511	Fluid Milk Manufacturing	1,307	-145	-10.0%
112000	Animal Production	1,003	143	16.6%
111000	Crop Production	498	135	37.1%
311919	Other Snack Food Manufacturing	432	42	10.8%
312130	Wineries	381	18	5.1%
311513	Cheese Manufacturing	372	-147	-28.3%
311111	Dog and Cat Food Manufacturing	294	119	68.4%
312120	Breweries	286	129	81.6%
311352	Confectionery Manufacturing from Purchased Chocolate	223	45	25.1%
311811	Retail Bakeries	131	--	0.1%
311812	Commercial Bakeries	131	45	51.7%
311942	Spice and Extract Manufacturing	93	33	56.2%
311999	All Other Miscellaneous Food Manufacturing	87	26	42.9%
311421	Fruit and Vegetable Canning	58	58	--
312140	Distilleries	40	40	--
311941	Mayonnaise, Dressing, and Other Prepared Sauce Manufacturing	30	6	26.2%
311821	Cookie and Cracker Manufacturing	21	-2	-7.0%
311611	Animal (except Poultry) Slaughtering	15	15	--
311612	Meat Processed from Carcasses	14	-41	-74.1%
311615	Poultry Processing	12	12	--
311119	Other Animal Food Manufacturing	0	-33	-100.0%
Total jobs		5,430	498	10.1%

Source:
Lightcast

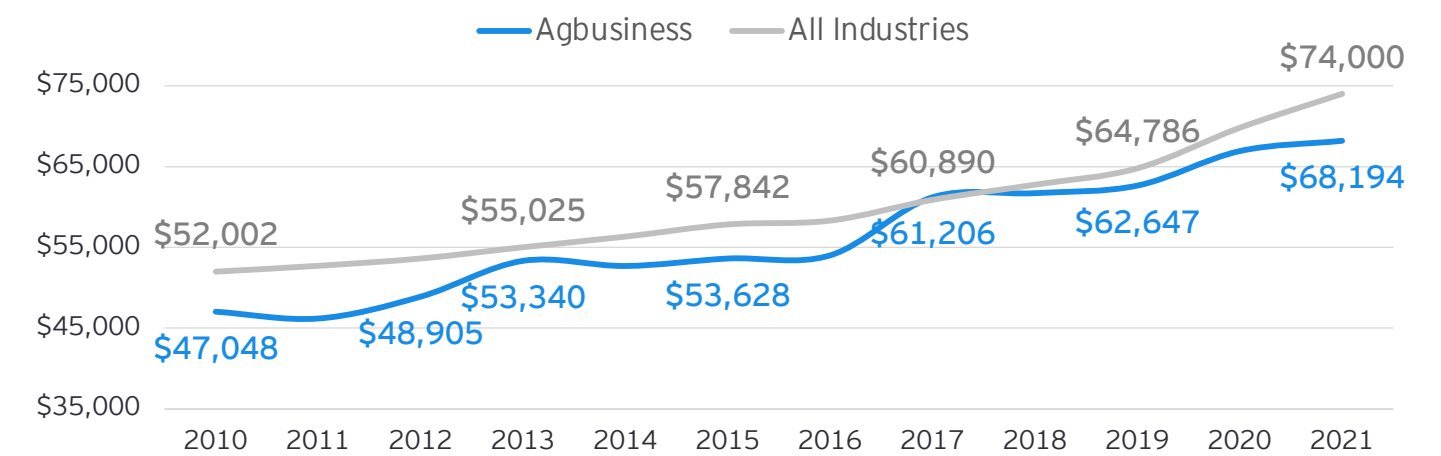
Animal and Crop Production account for the majority of Agribusinesses in the region, but 60 wineries and breweries are also present.

Southern Tier Region Agribusiness businesses, 2016 - 2021

NAICS Code	NAICS Description	No. of Businesses (2021)	Growth in No. of Businesses (2016-2021)	% Growth in No. of Businesses (2016-2021)
112000	Animal Production	110	19	21.2%
111000	Crop Production	87	20	30.5%
312130	Wineries	35	6	21.9%
312120	Breweries	25	11	75.4%
311811	Retail Bakeries	10	-2	-16.7%
311511	Fluid Milk Manufacturing	7	-3	-27.5%
311812	Commercial Bakeries	5	--	5.0%
312140	Distilleries	4	3	166.7%
311941	Mayonnaise, Dressing, and Other Prepared Sauce Man.	4	2	100.0%
311119	Other Animal Food Manufacturing	4	-1	-20.0%
311612	Meat Processed from Carcasses	3	-1	-25.0%
311111	Dog and Cat Food Manufacturing	3	-2	-33.3%
312112	Bottled Water Manufacturing	2	1	28.6%
311615	Poultry Processing	2	2	--
311611	Animal (except Poultry) Slaughtering	2	1	166.7%
311352	Confectionery Manufacturing from Purchased Chocolate	2	1	60.0%
311942	Spice and Extract Manufacturing	2	--	--
311513	Cheese Manufacturing	2	-1	-33.3%
311999	All Other Miscellaneous Food Manufacturing	2	-2	-50.0%
311224	Soybean and Other Oilseed Processing	1	1	--
311421	Fruit and Vegetable Canning	1	1	--
311211	Flour Milling	1	--	--
311911	Roasted Nuts and Peanut Butter Manufacturing	1	--	--
311919	Other Snack Food Manufacturing	1	--	--
312113	Ice Manufacturing	1	--	--
311821	Cookie and Cracker Manufacturing	1	-1	-50.0%
Total number of payrolled business locations		318	56	21.5%

Southern Tier worker earnings in Agribusiness are slightly below the average for all industries.

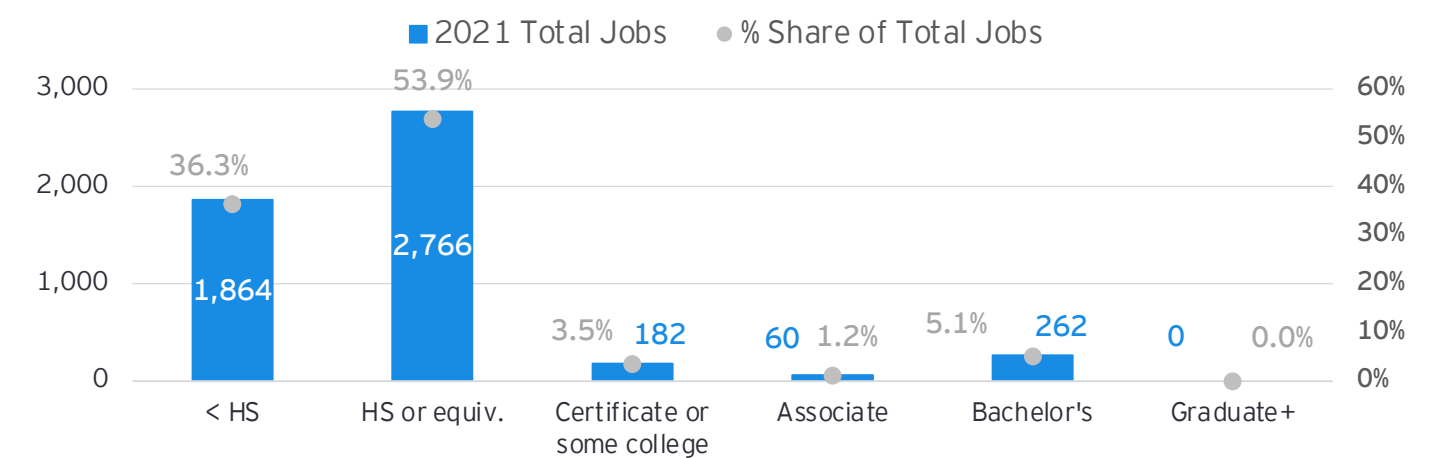
Average annual earnings, 2010 - 2021



Source:
EMSI

Few jobs in Southern Tier’s Agribusiness sector require more than a high school diploma.

Total jobs in by typical education requirement, Agribusiness, 2021

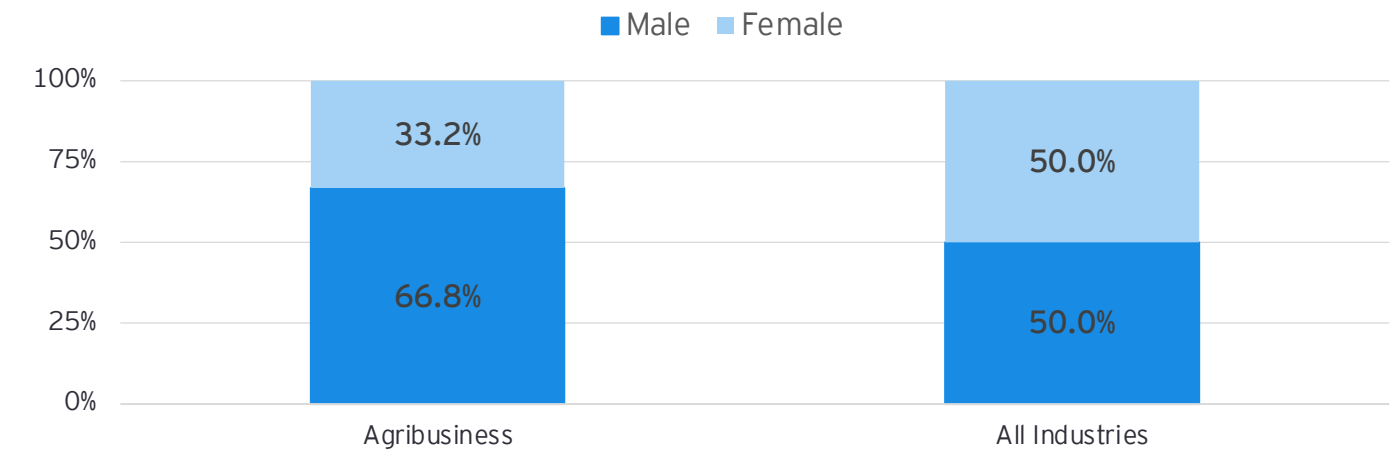


Source:
EMSI



Southern Tier’s gender split within Agribusiness mirrors the overall workforce, with just a slightly higher share of male employment.

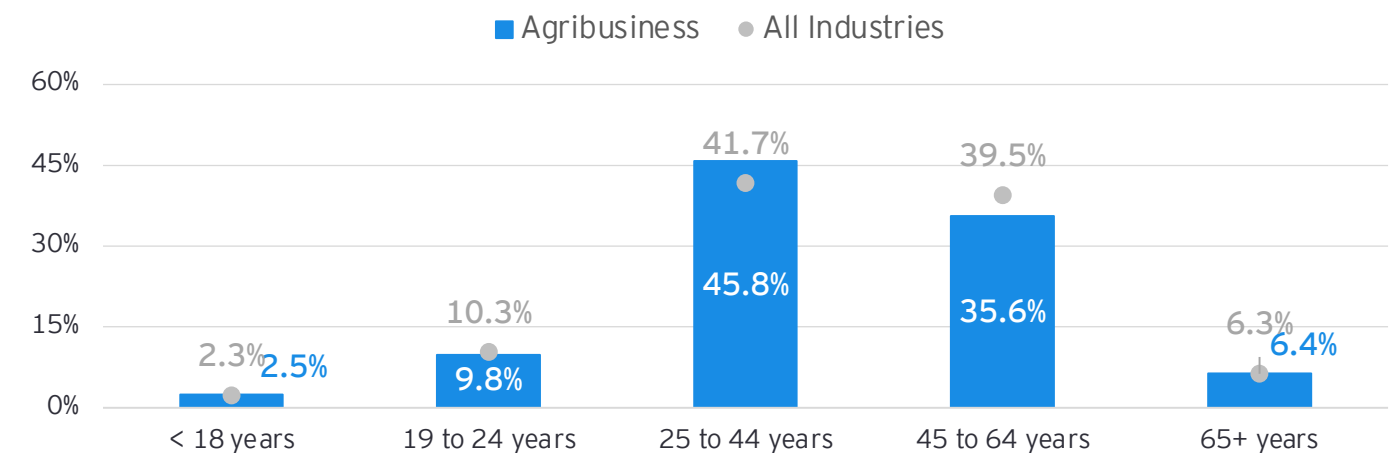
Employment within sector, by sex, 2021



Source:
Lightcast

A high percentage of Agribusiness workers in Southern Tier Island are in the 25-44 age range, with fewer workers in the 45-64 age range than the overall regional economy.

Employment within sector, by age, 2021



Source:
Lightcast

Occupations in Agribusiness are most abundant for workers with education attainment levels of a high school diploma or less.

Top 25 Agribusiness occupations with entry-level educational requirements and median hourly earnings, 2021

SOC Code	SOC Description	No. of Jobs (2021)	Median Hourly Earnings (2021)	Typical Entry Level Edu. Req. (2021)
51-9111	Packaging and Filling Machine Operators and Tenders	574	\$15.16	HS diploma or equiv.
45-2092	Farmworkers and Laborers, Crop, Nursery, and...	473	\$13.05	No formal education
11-9013	Farmers, Ranchers, and Other Agricultural Managers	395	\$15.95	HS diploma or equiv.
51-3092	Food Batchmakers	231	\$18.19	HS diploma or equiv.
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	204	\$13.17	No formal education
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	179	\$15.47	No formal education
49-9071	Maintenance and Repair Workers, General	161	\$19.62	HS diploma or equiv.
51-1011	First-Line Supervisors of Production & Op. Workers	144	\$31.26	HS diploma or equiv.
53-3032	Heavy and Tractor-Trailer Truck Drivers	135	\$22.63	Postsec. Nondegree
51-9012	Separating, Filtering, Clarifying, Precipitating, & Still...	116	\$20.23	HS diploma or equiv.
53-7051	Industrial Truck and Tractor Operators	107	\$18.29	No formal education
53-7064	Packers and Packagers, Hand	107	\$14.24	No formal education
45-2099	Agricultural Workers, All Other	102	\$15.15	No formal education
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	92	\$20.19	HS diploma or equiv.
41-4012	Sales Reps., Wholesale and Manufacturing, Except...	92	\$29.17	HS diploma or equiv.
41-2031	Retail Salespersons	91	\$14.07	No formal education
49-9041	Industrial Machinery Mechanics	85	\$28.31	HS diploma or equiv.
11-1021	General and Operations Managers	85	\$43.68	Bachelor's degree
43-5061	Production, Planning, and Expediting Clerks	80	\$24.45	HS diploma or equiv.
45-2091	Agricultural Equipment Operators	75	\$13.26	No formal education
51-3011	Bakers	73	\$14.41	No formal education
37-2011	Janitors & Cleaners, Except Maids and Housekeeping...	67	\$14.80	No formal education
43-5071	Shipping, Receiving, and Inventory Clerks	64	\$17.79	HS diploma or equiv.
35-3023	Fast Food and Counter Workers	61	\$13.79	No formal education
35-3011	Bartenders	61	\$14.94	No formal education
Total jobs in top 25 occupations		3,854	\$19.25	

Source:
Lightcast

Agribusiness | Occupational Analysis

For positions requiring a high school diploma or equivalent, most jobs in Agribusiness are for machine operators, laborers and other support positions.

Top 25 Agribusiness occupations with entry-level educational requirements of high school diploma or less with median hourly earnings, 2021

SOC Code	SOC Description	No. of Jobs (2021)	Median Hourly Earnings (2021)	Typical Entry Level Edu. Req. (2021)
51-9111	Packaging and Filling Machine Operators and Tenders	574	\$15.16	HS diploma or equiv.
45-2092	Farmworkers and Laborers, Crop, Nursery, and...	473	\$13.05	No formal education
11-9013	Farmers, Ranchers, and Other Agricultural Managers	395	\$15.95	HS diploma or equiv.
51-3092	Food Batchmakers	231	\$18.19	HS diploma or equiv.
45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	204	\$13.17	No formal education
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	179	\$15.47	No formal education
49-9071	Maintenance and Repair Workers, General	161	\$19.62	HS diploma or equiv.
51-1011	First-Line Supervisors of Production and Operating...	144	\$31.26	HS diploma or equiv.
51-9012	Separating, Filtering, Clarifying, Precipitating, & Still...	116	\$20.23	HS diploma or equiv.
53-7051	Industrial Truck and Tractor Operators	107	\$18.29	No formal education
53-7064	Packers and Packagers, Hand	107	\$14.24	No formal education
45-2099	Agricultural Workers, All Other	102	\$15.15	No formal education
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	92	\$20.19	HS diploma or equiv.
41-4012	Sales Representatives, Wholesale and Manufacturing,...	92	\$29.17	HS diploma or equiv.
41-2031	Retail Salespersons	91	\$14.07	No formal education
49-9041	Industrial Machinery Mechanics	85	\$28.31	HS diploma or equiv.
43-5061	Production, Planning, and Expediting Clerks	80	\$24.45	HS diploma or equiv.
45-2091	Agricultural Equipment Operators	75	\$13.26	No formal education
51-3011	Bakers	73	\$14.41	No formal education
37-2011	Janitors & Cleaners, Except Maids and Housekeeping...	67	\$14.80	No formal education
43-5071	Shipping, Receiving, and Inventory Clerks	64	\$17.79	HS diploma or equiv.
35-3023	Fast Food and Counter Workers	61	\$13.79	No formal education
35-3011	Bartenders	61	\$14.94	No formal education
51-9192	Cleaning, Washing, and Metal Pickling Equipment...	52	\$23.19	HS diploma or equiv.
53-7065	Stockers and Order Fillers	49	\$14.50	HS diploma or equiv.
Total jobs in top 25 occupations		3,735	\$18.11	

Source:
Lightcast

Agribusiness | Occupational Analysis

For certificate or associate level positions, opportunity are comparatively limited with jobs for drivers, technicians, and clerks being most abundant.

Top Agribusiness occupations with mid-level educational requirements of certificate through associate degree with median hourly earnings, 2021

SOC Code	SOC Description	No. of Jobs (2021)	Median Hourly Earnings (2021)	Typical Entry Level Edu. Req. (2021)
53-3032	Heavy and Tractor-Trailer Truck Drivers	135	\$22.63	Postsec. Nondegree
19-4013	Food Science Technicians	49	\$24.47	Associate degree
43-3031	Bookkeeping, Accounting, and Auditing Clerks	47	\$18.98	Some college
15-1231	Computer Network Support Specialists	11	\$26.97	Associate degree
49-9021	Heating, Air Conditioning, & Refrigeration Mechanics...	<10	\$26.44	Postsec. Nondegree
19-4031	Chemical Technicians	<10	\$26.54	Associate degree
19-4042	Environmental Science and Protection Technicians,...	<10	\$22.25	Associate degree
19-4099	Life, Physical, and Social Science Technicians, All Other	<10	\$23.16	Associate degree
43-4151	Order Clerks	<10	\$16.65	Some college
49-3023	Automotive Service Technicians and Mechanics	<10	\$20.78	Postsec. Nondegree
49-2094	Electrical and Electronics Repairers, Commercial & Ind...	<10	\$25.94	Postsec. Nondegree
43-4161	HR Assistants, Except Payroll and Timekeeping	<10	\$23.17	Associate degree
19-4012	Agricultural Technicians	<10	\$21.31	Associate degree
17-3023	Electrical and Electronic Engineering Technologists &...	<10	\$24.23	Associate degree
17-3026	Industrial Engineering Technologists and Technicians	<10	\$28.25	Associate degree
17-3027	Mechanical Engineering Technologists and Technicians	<10	\$29.86	Associate degree
15-1232	Computer User Support Specialists	<10	\$25.10	Some college
17-3029	Engineering Technologists and Technicians, Except...	<10	\$23.74	Associate degree
Total jobs in top 25 occupations		268	\$25.52	

Source:
Lightcast

Agribusiness | Occupational Analysis

For positions requiring a bachelor's or advanced degree, positions are more limited comparatively. Most jobs are for managers, accountants, and scientists.

Top 25 Agribusiness occupations with high-level educational requirements of bachelor's and above with median hourly earnings, 2021

SOC Code	SOC Description	No. of Jobs (2021)	Median Hourly Earnings (2021)	Typical Entry Level Edu. Req. (2021)
11-1021	General and Operations Managers	85	\$43.68	Bachelor's degree
11-3051	Industrial Production Managers	31	\$53.26	Bachelor's degree
13-2011	Accountants and Auditors	30	\$36.45	Bachelor's degree
19-1012	Food Scientists and Technologists	25	\$31.34	Bachelor's degree
13-1161	Market Research Analysts and Marketing Specialists	23	\$31.37	Bachelor's degree
13-1028	Buyers and Purchasing Agents	20	\$31.02	Bachelor's degree
17-2112	Industrial Engineers	19	\$39.57	Bachelor's degree
13-1071	Human Resources Specialists	18	\$31.75	Bachelor's degree
11-2022	Sales Managers	11	\$62.00	Bachelor's degree
19-4021	Biological Technicians	<10	\$19.71	Bachelor's degree
27-2022	Coaches and Scouts	<10	\$23.29	Bachelor's degree
27-1024	Graphic Designers	<10	\$24.25	Bachelor's degree
25-3099	Teachers and Instructors, All Other	<10	\$28.81	Bachelor's degree
19-5011	Occupational Health and Safety Specialists	<10	\$33.07	Bachelor's degree
41-4011	Sales Reps., Wholesale and Manufacturing, Technical...	<10	\$47.23	Bachelor's degree
19-2031	Chemists	<10	\$26.89	Bachelor's degree
27-3031	Public Relations Specialists	<10	\$31.60	Bachelor's degree
29-1131	Veterinarians	<10	\$49.00	Graduate +
45-2011	Agricultural Inspectors	<10	\$25.97	Bachelor's degree
11-1011	Chief Executives	<10	\$62.20	Bachelor's degree
13-1081	Logisticians	<10	\$38.45	Bachelor's degree
17-2199	Engineers, All Other	<10	\$46.33	Bachelor's degree
13-1041	Compliance Officers	<10	\$30.56	Bachelor's degree
11-9199	Managers, All Other	<10	\$40.71	Bachelor's degree
17-2141	Mechanical Engineers	<10	\$40.07	Bachelor's degree
Total jobs in top 25 occupations		262	\$37.14	

Source:
Lightcast

Agribusiness| Workforce Gap Analysis

Agribusinesses require fewer workers with postsecondary education than most industries. Still technicians and maintenance workers are needed along with select engineering and scientist positions. The gap analysis below shows that Southern Tier underproduces (accredited) and produces a wealth of graduates in agriculture management and agriculture, environmental, and veterinary sciences.

The table below shows occupation groups that are matched to degree programs to determine if the supply of graduates is sufficient to meet demand (measured as job openings in a year). A US comparison helps clarify if there is a gap or overproduction of graduates by comparing regional graduates to jobs with the US ratio of graduates to jobs (as shown in the right column below).

Certificate-level positions are not served by local programs (at accredited institutions, not including non-profits), which may suggest Agribusinesses are reliant on for-profit educators, on-the-job training, or recruiting from outside the region. Certificate programs lacking that serve Agribusiness include **Industrial Machinery Maintenance** and **Small Engine Mechanics**.

Bachelor's-level positions are well-served by local programs. **Agriculture Managers, Agricultural Scientists, and Environmental Scientists** graduate from local institutions at levels far higher than local job openings require - offering a potential value proposition to any relocating/expanding company in the region.

Also, while few job openings are created for **Veterinarians** at the PhD level, the region produces a large number of graduates. **Vet Technologists** also are overproduced relative to local need.

Supply-Demand Gap Conditions
Agribusiness, Southern Tier

Gap	Occupation Group	Avg. Educ. Level	Regional 2021 Job Openings	Graduates	Regional Ratio	Supply-demand Ratio versus US
Lg Shortage	Industrial Machinery Maintenance	Certificate	92	0	0%	0%
	Small Engine Mechanics	Certificate	19	0	0%	0%
	Forest and Conservation Technicians	Associate's	16	0	0%	0%
Lg Over-Supply	Environmental Science Technicians	Associate's	4	14	350%	872%
	Veterinary Technologists and Technicians	Associate's	32	67	210%	431%
	Farm and Greenhouse Managers	Bachelor's	64	332	516%	1107%
	Agricultural & Food Scientists	Bachelor's	22	188	844%	756%
	Environmental Scientists & Engineers	Bachelor's	24	321	1348%	528%
	Veterinarians	PhD	4	107	2675%	4111%

Lg Shortage Shortage In-Balance Over-Supply Lg Over-Supply

Source:
EY analysis of data from Lightcast and US Dept. of Education

More on the Methodology

“Job openings” in 2021 is used to determine demand, which is a combination of workforce turnover and retirement as well as net new jobs. Regional job openings are compared to regional graduate output using an SOC-CIP taxonomy that accounts for education levels. (For example, a Bachelor’s in Psychology is not matched with a Psychologist occupation because a Master’s or PhD is required.)

Furthermore, the “supply-demand gap” doesn’t hold true as a 1:1 ratio for all occupations. Therefore, we compare the regional ratio to the US ratio to determine if regional graduate output is relatively high or low. This Regional-to-US ratio also compensates for “non-accredited” programs that may exist but aren’t in the data (e.g. for-profits that aren’t required to report their enrollment data to the government). For example, non-profits may train Home Health Aides which aren’t in the data, but the regional comparison of “accredited” graduates to the US does help inform if a local gap may exist.

We determine the regional gap or oversupply in the right column (“ratio vs. US”). If regional graduate output is less than 50% of the US ratio, then we determine there is a large shortage and color the first “Gap” column a dark red. See the legend for colors and their ranges below.


Why does graduate output not always match job openings evenly? Graduates sometimes choose other occupations: Welding may need more graduates since many may finish the program and then choose other jobs, or an Electrical Engineering graduate with a minor in Business may choose a sales but not engineering job. Some positions, like Executive Secretaries or Logistics Clerks are helped by Certificates but many workers learn their skill on the job.

Data is sourced from US Dept. of Education’s IPEDS programs (graduate output) and Lightcast/EMSI (job openings by occupation by county). We use a custom taxonomy allocates 1,000 occupation codes and 10,000 graduate program codes (CIP+AwardLevel combinations) into 310 occupation groups. Some degree programs aren’t matched if they don’t align with jobs in the SOC system or if more education is needed to enter the occupation.

Gap Legend and Ratio Ranges:

High Shortage	Shortage	In Balance	Over-Supply	Large Over-Supply
Less than 50% of US Ratio	50% up to 80%	80% up to 120% (About even w/US)	120% up to 200%	200% or higher than US Ratio





Educational programming

About this chapter

The educational programming chapter explores the overall educational attainment levels within the region, the typical entry-level educational attainment requirements by target sector, and the educational pipeline for the region. With this analysis, we seek to understand the talent supply within the region and the opportunity for employment within a target sector at various educational attainment levels. Key metrics in this chapter include:

- ▶ Educational attainment levels
- ▶ Degree production by award type
- ▶ Enrollment by level and full-time status
- ▶ Type of certificate production
- ▶ Jobs by typical entry-level educational requirement by target sector

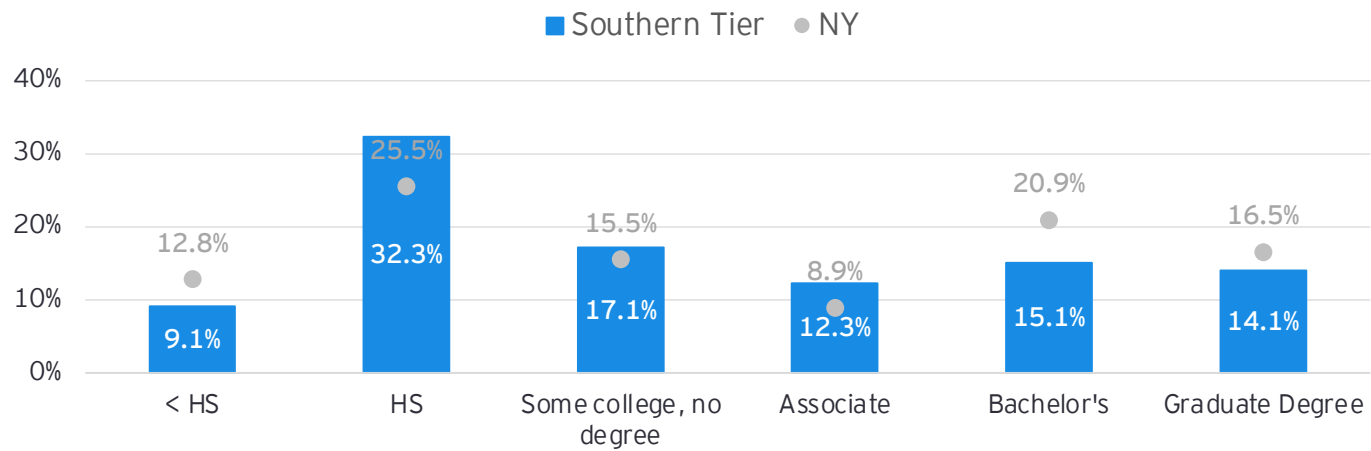
Key findings

- ▶ The population in Southern Tier is educated evenly across postsecondary levels, with 12-17% of adults having some college, an associate, bachelor's or a graduate degree. Over 40% of adults have a high school diploma or less, and educational attainment is improving.
- ▶ Of the 18,000 postsecondary graduates from Southern Tier institutions, 85% are at the bachelor's level or higher.
- ▶ Most college graduates in Southern Tier get degrees in Business or Engineering at the bachelor's level or above. Graduate increases are highest in the Southern Tier in Health and IT programs.
- ▶ New registered apprentices have more than doubled in Southern Tier since 2016 and are currently at their highest levels. Over 700 new apprentices entered programs in 2021. Most pursue Electrician training.

Educational Programming

The population in Southern Tier is educated evenly across postsecondary levels, with 12-17% of adults having some college, an associate, bachelor's or a graduate degree. Over 40% of adults have a high school diploma or less.

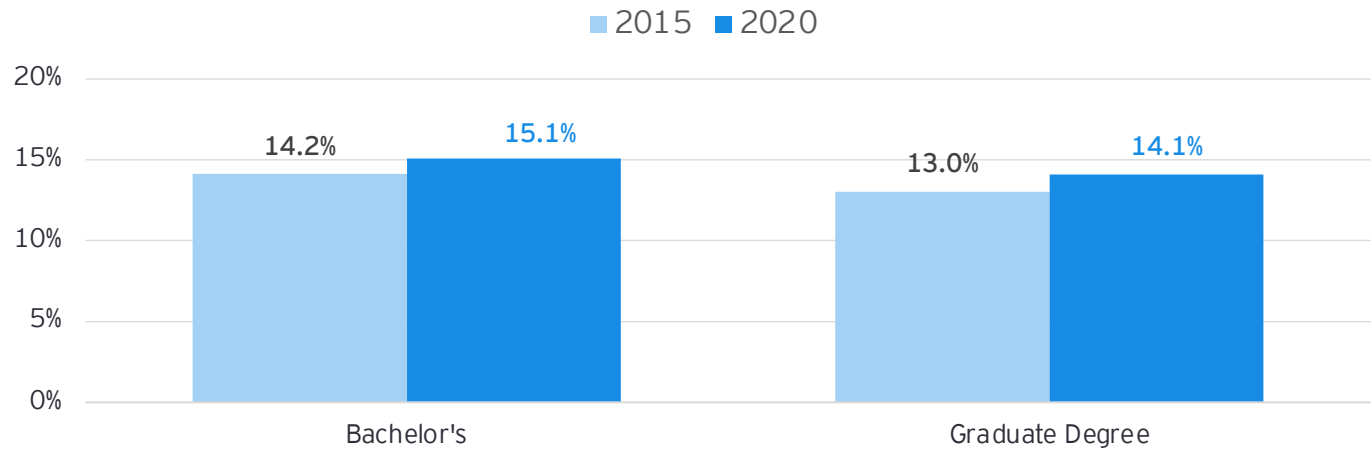
Educational attainment of population age 25 and older, 2020



Source:
US Census Bureau

The bachelor's+ educational attainment of Southern Tier's adult population has improved slightly between 2015 and 2020.

Educational attainment for population age 25 and older, 2015 vs. 2020



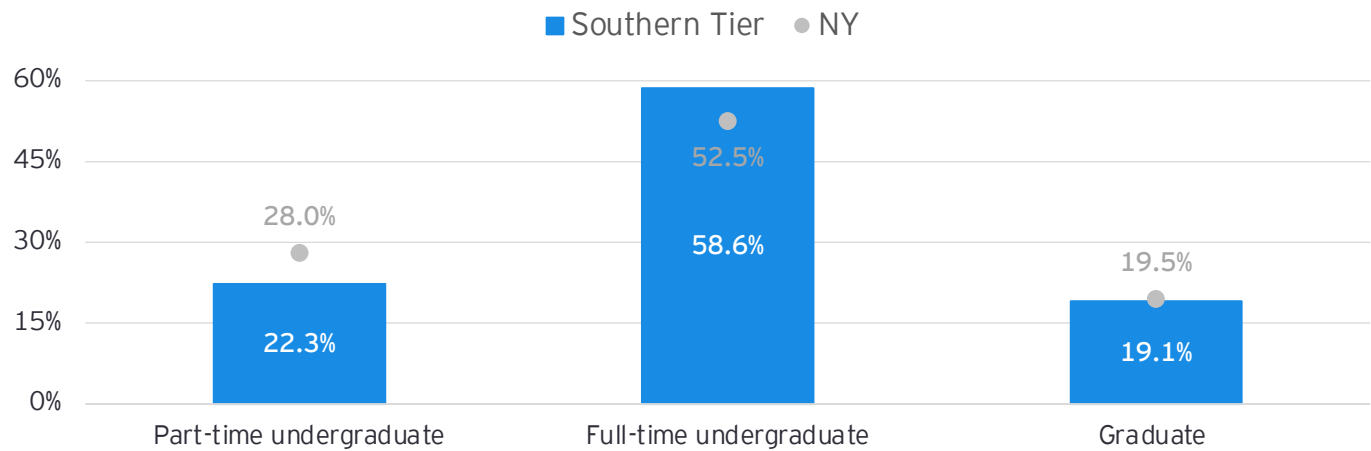
Source:
US Census Bureau



Educational Programming

Most post-secondary students in Southern Tier are full-time undergraduates and graduates.

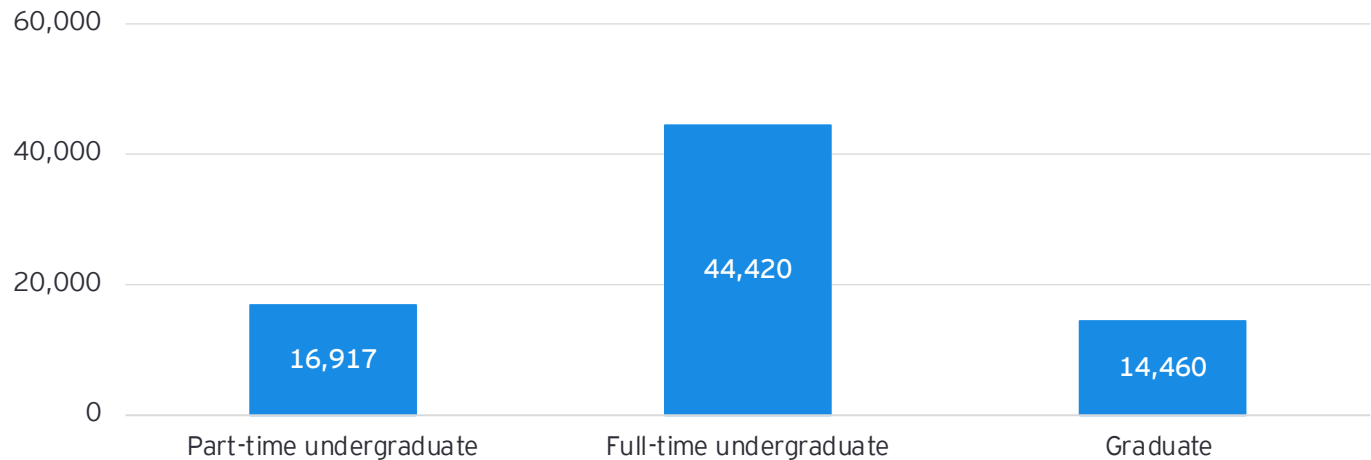
Share of enrollment in higher education institutions by level 2020 - 2021 academic year



Source:
National Science Foundation, IPEDS Survey

Of the 76,000 post-secondary students in Southern Tier, nearly two-thirds are undergraduates.

Enrollment in higher education institutions by level 2020 - 2021 academic year



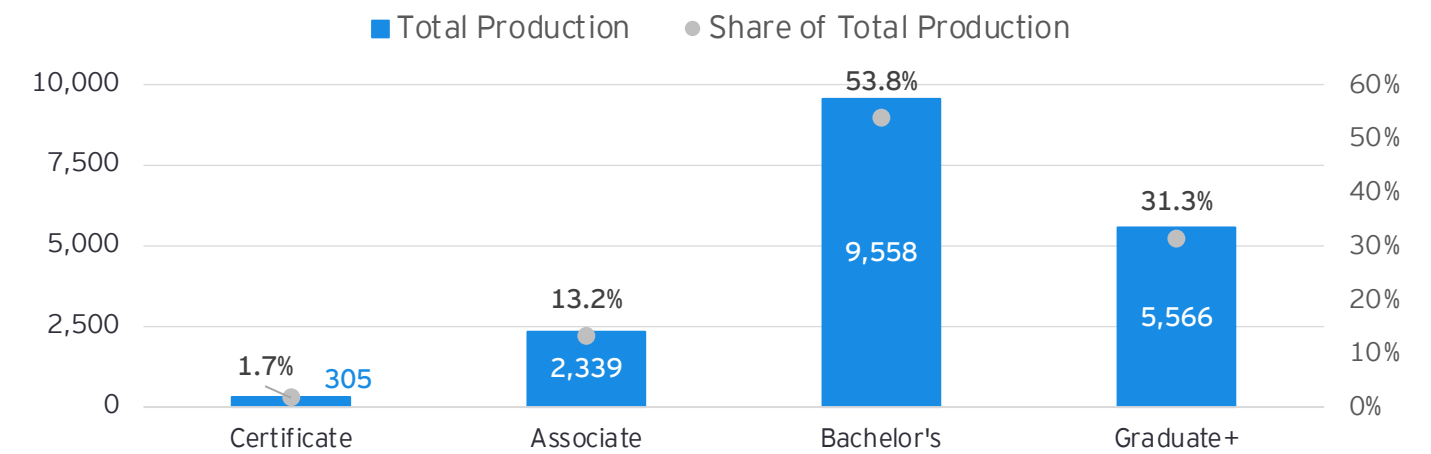
Source:
National Science Foundation, IPEDS Survey



Educational Programming

Of the 18,000 postsecondary graduates from Southern Tier institutions, 85% are at the bachelor's level or higher.

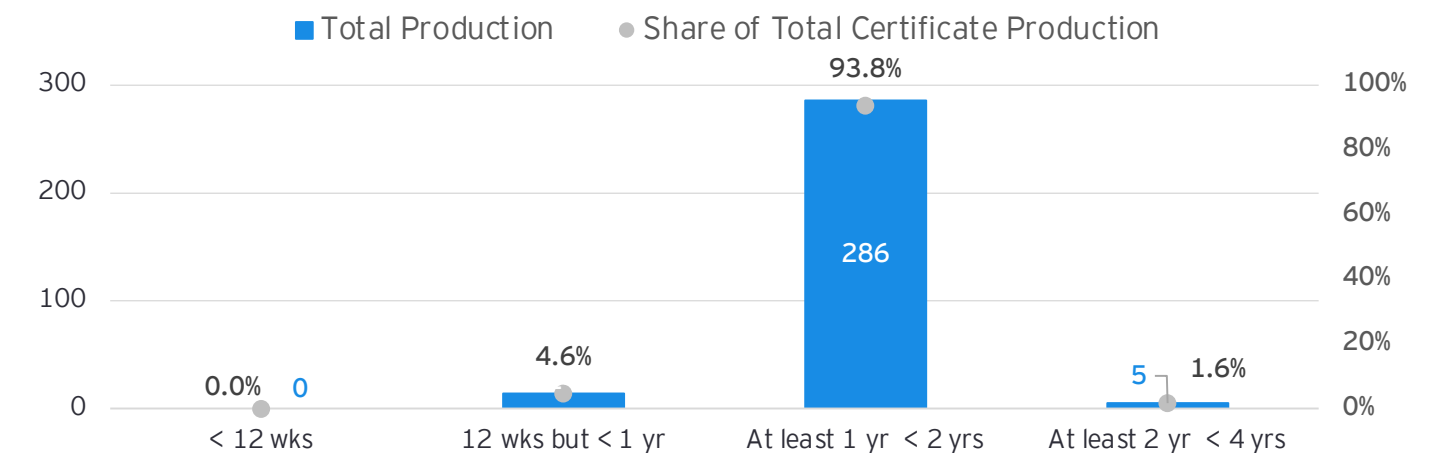
Degree production 2020 - 2021 academic year



Source:
National Science Foundation, IPEDS Survey

Accredited certificate production in Southern Tire is highest for 1-year programs, and few short-term programs are available.

Certificate production 2020 - 2021 academic year



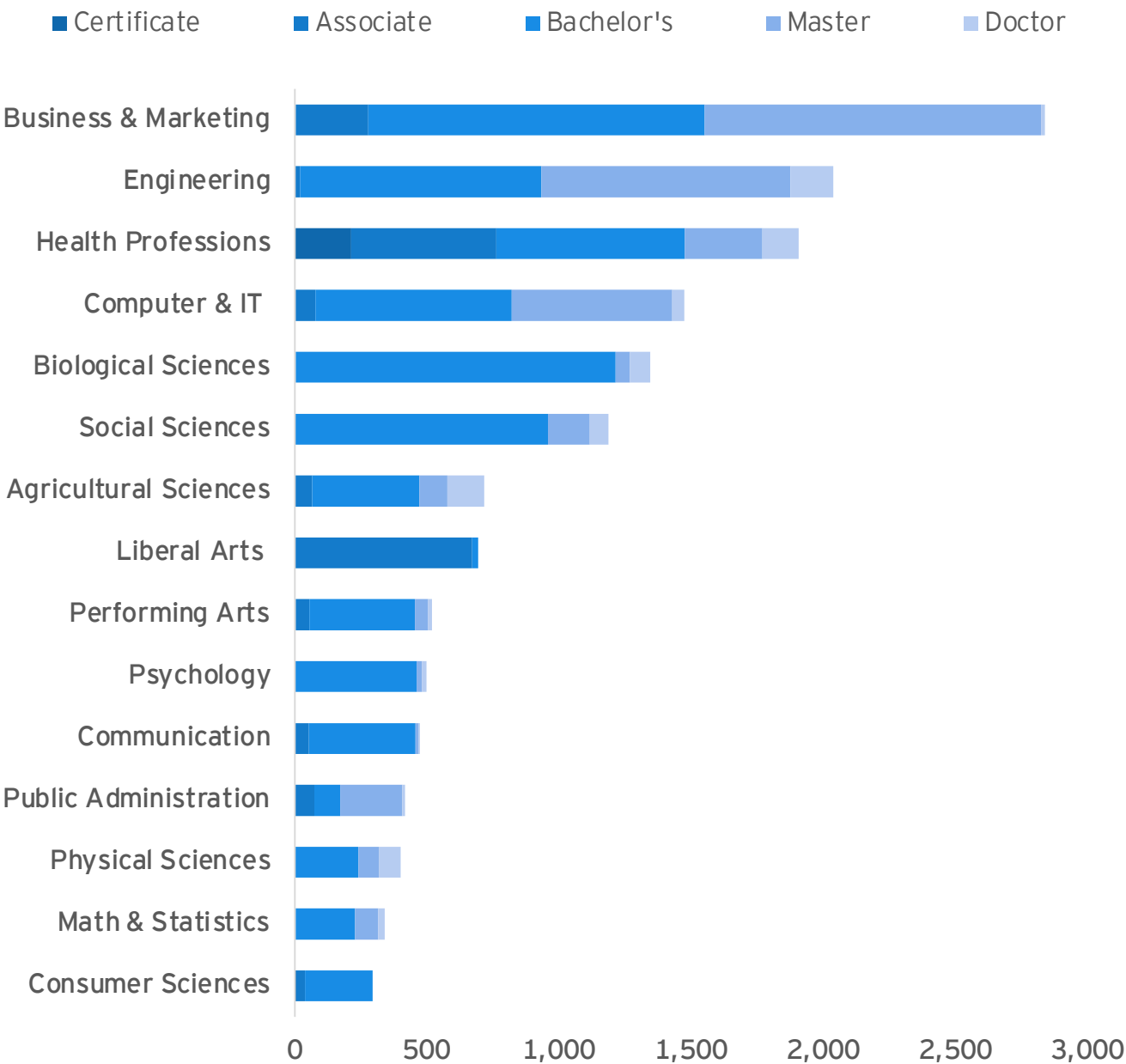
Source:
US Bureau of Labor Statistics



Educational Programming

Most college graduates in Southern Tier get degrees in Business or Engineering at the bachelor's level or above. Health graduates are third-highest output and include graduates with associate and some certificates. Other large programs include Computer/IT, Biological Sciences, and Social Sciences.

Top 15 degrees by award level by CIP, 2020-2021 academic year



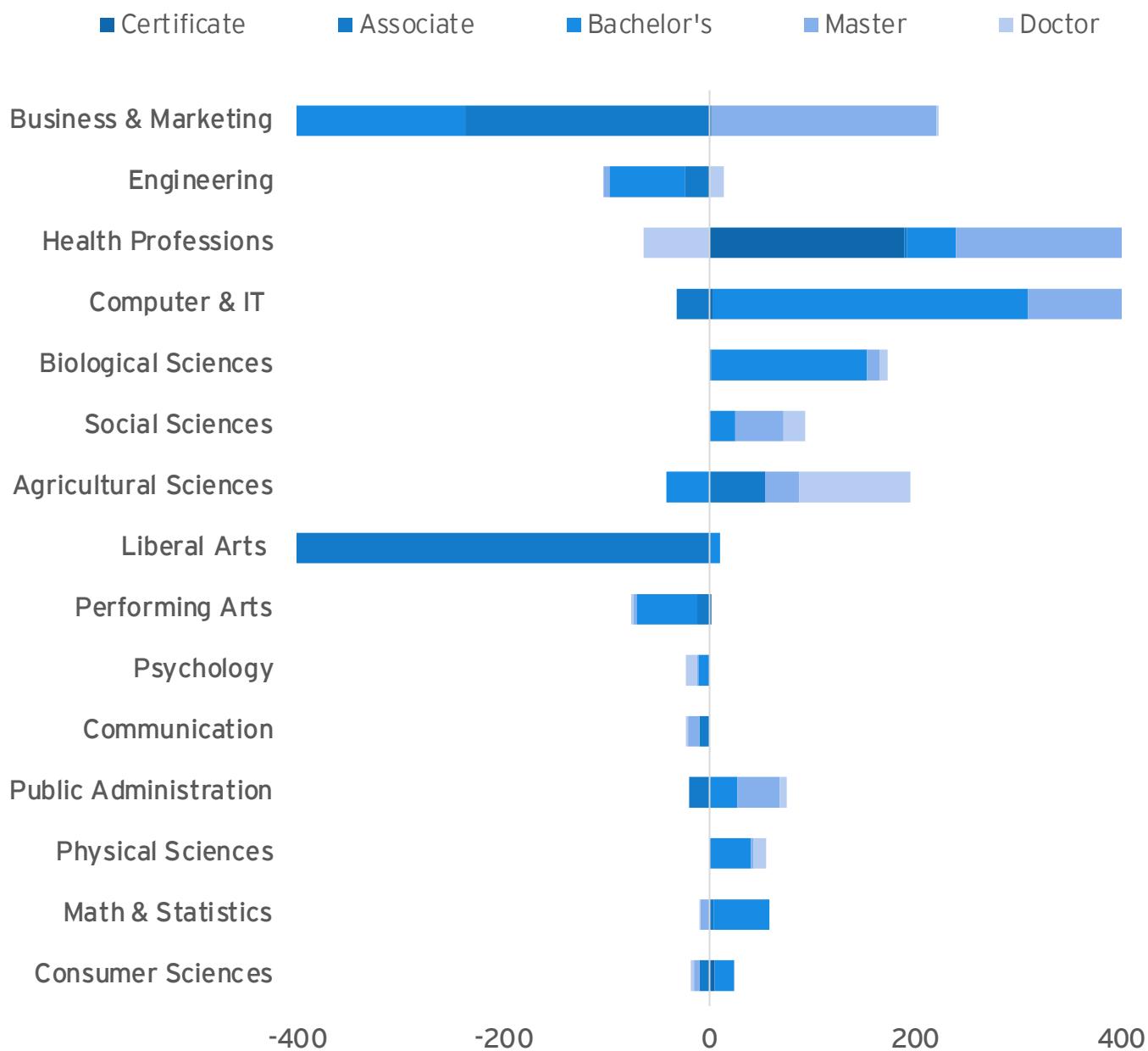
Source:
National Science Foundation, IPEDS Survey



Educational Programming

Graduate increases are highest in the Southern Tier in Health and IT programs. Bachelor's in IT increased by over 300 graduates over the last 5 years. Master's in Business grew by 220 graduates and Biology Bachelor's grew by 151. Some declines at the Associate's level (Business and Liberal Arts) may reflect a change in institutional offerings.

Change in top 15 degrees by award level by CIP, 2015-2016 to 2020-2021 academic year



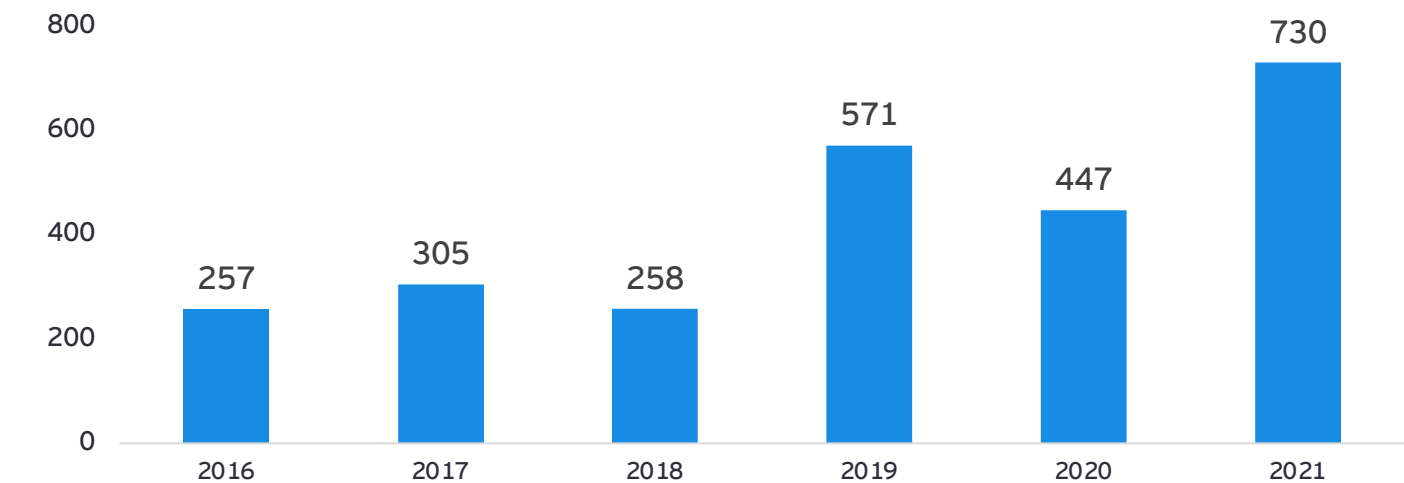
Source:
National Science Foundation, IPEDS Survey



Educational Programming

New registered apprentices have more than doubled in Southern Tier since 2016 and are currently at their highest levels. Over 700 new apprentices entered programs in 2021.

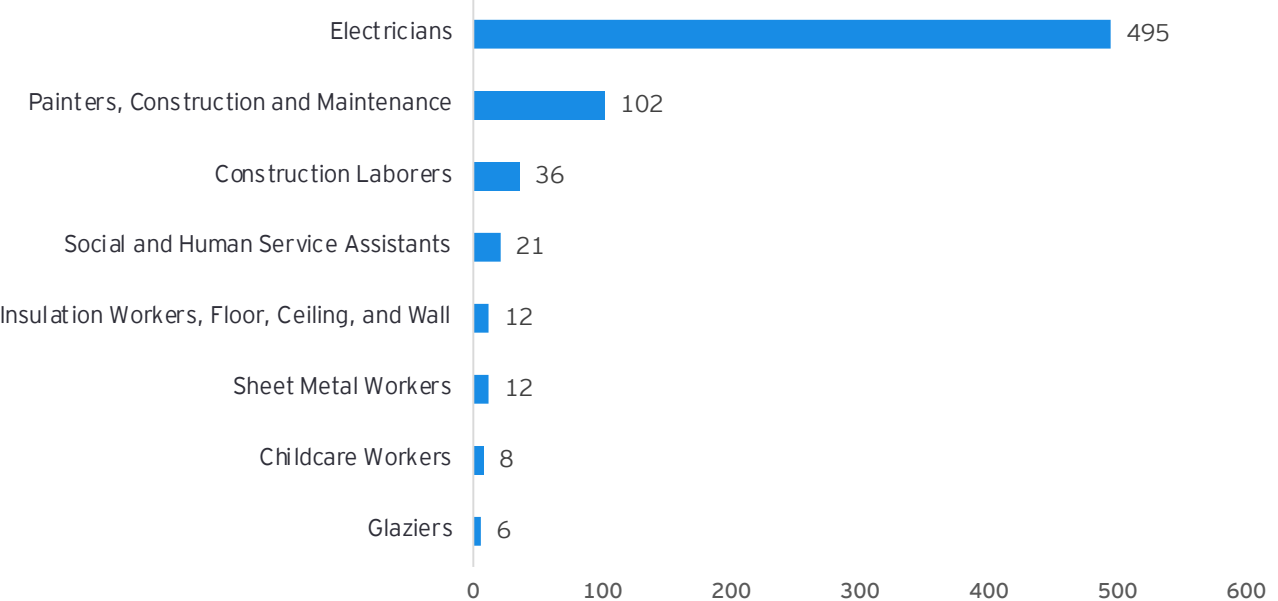
New Registered Apprentices in Southern Tier, 2016-2021



Source:
DOL RAPIDS

Electrician apprentices are the top apprenticeship program within the region followed by Painters, Construction and Maintenance. Electrical programs experienced the most significant growth followed by Glaziers.

New Registered Apprentices by Occupation in Southern Tier, 2021



Source:
DOL RAPIDS

Data sources used as part of the research appendix report

Population and components of population
US Census Bureau, Population Estimates

Population by race
US Census Bureau, ACS 5-year estimates

Population by age cohort
US Census Bureau, ACS 5-year estimates

Unemployment rate
Bureau of Labor Statistics, LAUS

Labor force
US Bureau of Labor Statistics, QCEW
Bureau of Labor Statistics, LAUS

Foreign-born population
US Census Bureau, ACS 5-year estimates

Non-Citizen population
US Census Bureau, ACS 5-year estimates

Language other than English
US Census Bureau, ACS 5-year estimates

Modes of transportation and commute times
US Census Bureau, ACS 5-year estimates

Poverty rate
US Census Bureau, ACS 5-year estimates

Population with disability
US Census Bureau, ACS 5-year estimates

Civilian labor force participation rate 16+ years
US Census Bureau, ACS 5-year estimates

Unemployment rate 16+ years
US Census Bureau, ACS 5-year estimates

Labor force by age, race/ethnicity, and education
US Census Bureau, ACS 5-year estimates

Unemployment rate by age, race/ethnicity, and education
US Census Bureau, ACS 5-year estimates

Talent inflow/outflow
US Census Bureau, OnTheMap

Resident worker migration
Lightcast

Employment
US Census Bureau, ACS 5-year estimates
US Bureau of Labor Statistics, QCEW
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Top industries by employment
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Employment by industry
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Number of payrolled business locations
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Average annual earnings by industry
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Typical entry-level education by industry
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Sector employment by age and sex
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Educational attainment of residents aged 25 and older
US Census Bureau, ACS 5-year estimates

Enrollment in higher education
National Science Foundation, IPEDS Survey

Post-secondary degree production
National Science Foundation, IPEDS Survey

Degree production by award level and CIP
National Science Foundation, IPEDS Survey

Apprenticeships data
US Department of Labor, RAPIDS

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